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MATH GENIUS

Think Smart, Solve Fast

Ver. 2.0 



Lesson Plan

Experience the Joy of Learning Mathematical Skills



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PREFACE

The Teacher's Resource Manual is specially developed for teachers using **Math Genius!** Coursebooks. The manual has been designed to provide the teacher with additional materials and support that they may require to effectively teach the coursebook. Each **Teacher's Resource Manual** is completely mapped with its coursebook. The method of teaching/learning suggested in the book is completely based on the Learning-by-doing method which supports guidelines and aids of classroom teaching as per the New Education Policy 2020. The classroom teaching/learning activity helps to allay the fear of Mathematics from the minds of the learners and develops an inherent link for the subject.

Each **Teacher's Resource Manual** has two segments—Chapter-wise detailed **Lesson Plans based on 6E model** and **Practice Materials** in the form of **Worksheets**.

Features of the Teacher's Resource Manual:

Detailed Lesson Plan: It contains Topics to be covered in the chapter, Suggested Allocation of Periods, Teaching Objectives, Learning Objectives and Suggested Teaching Aids.

- ❖ **Each lesson plan is based on 6E's:** The 6E lesson plan is based on an instructional model that consists of six phases or steps: Engage, Explore, Explain, Elaborate, Evaluate and Enhance.
- ❖ **Engage:** It enhances students' curiosity, interest, and engagement and help them access prior knowledge.
- ❖ **Explore:** It provides students with opportunities to construct learning experience through activities.
- ❖ **Explain:** students acquire opportunities to explain their learning experiences with the current learning and to conceptualise the topic's main ideas.
- ❖ **Elaborate:** Students apply their knowledge to real-world applications.
- ❖ **Evaluate:** it allows teachers and students to recognize the learning effect and review and assess what they have learned and how they have learned it.
- ❖ **Enhance:** Provides students time to think, plan, investigate, and organize collected information.

Worksheets: This segment has worksheets for each chapter which can be used for practice and evaluation of learners' understanding of the concepts taught. At the end, answers to each worksheet have been given.

A teacher has to use his/her experience and expertise in teaching the subject. This **Teacher's Resource Manual** provides some methodology in this regard but in no way does it limit the scope of the teaching. As per the interest, experience and proficiency of the teaching, you are advised to make suitable additions and modifications to the methodology being discussed.

Suggestions for the improvement of the book by the teachers' community will be gratefully acknowledged by us.

—Publisher



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Numbers up to 999

Learning Objectives

After studying this chapter, students will be able to...

- ◆ build, read and write numbers and number names up to 999
- ◆ understand the place value concept, apply it to compare and ordering 3-digit numbers
- ◆ write numbers in different ways
- ◆ understand ordinal numbers
- ◆ explore even and odd numbers
- ◆ apply various concepts related to 3-digit numbers in daily life

LESSON PLAN

Suggested number of periods: 18

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, dienes blocks up to 999, some real-life objects, pen, pencils, etc.

Keywords: Number, Digit, Place value, Face value, Expanded form, Successor, Predecessor, Even numbers, Odd numbers, Ascending order, Descending order, Ordinal numbers, Cardinal number, etc.

Pre-requisite knowledge: Students must be familiar with 2-digit numbers, their number names, the smallest and greatest 2-digit numbers, ordinal number up to tenth.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–3

Topics: Building 3-digit numbers up to 200, Reading numbers up to 200

Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, dienes blocks, ice-cream sticks, rubber band, etc. Math Genius 2, Pages 7–11

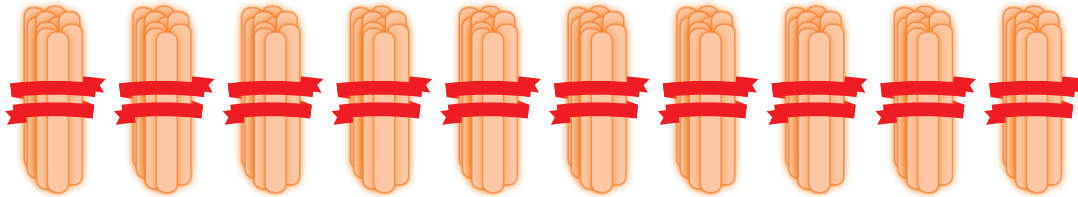
ENGAGE

Introduce the topic in the classroom with some interesting activities:

- Divide the class into 10 groups. And ask the group to count 1 to 10, next group count 11 to 20, ... and so on.
- Write few two digits numbers on board and ask one by one to read the numbers loudly.
- Ask to solve the question given in ‘Get ready’ section.

EXPLORE

Divide the class into small groups. Distribute some ice-cream sticks and rubber bands to the groups. Instruct them to make the bundles of 10 ice-cream sticks as many as they can and keep 10 such bundles in row. Then tell to count all ten bundles together. What number do they represent?



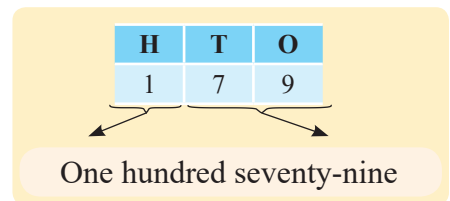
Accept the responses. Now, keep adding more rows of 10 such bundles of ice-cream sticks one after another. Ask: If 1 row of 10 bundles of 10 ice-cream sticks each represents one hundred, then what numbers will 2 rows of 10 such bundles, 3 rows of such bundles, up to 9 rows of 10 such bundles represent? Accept the responses. Again ask: If adding loose ice-cream sticks with the 1 row of 10 bundles, what numbers will form? Accept the responses.

[Experiential Learning]

EXPLAIN

Explain that when we add 1 one to 9 ones we get 10 ones or 1 ten. Similarly, 2 tens make 20, 3 tens make 30, ... 10 tens make 1 hundred. If we add 1 one to 1 hundred, it makes 101 and so on. Similarly, if we add 1 ten to 1 one hundred, it makes 110, and so on.

Further explain that to read a 3-digit number, first read the hundreds digit then read the remaining digits together.



ELABORATE

Demonstrate in the classroom the making of 3-digit numbers up to 200 with help of the dienes blocks by putting the blocks on table or show in smart board. Refer textbook pages 8–9 for more explanation and examples. Discuss about ‘Life Skills’ given on page 9.

[Cross Curricular Learning]

EVALUATE

Classwork: Ask to solve Q.1, 2 and 5 of Practice Time 1A.

Homework: Ask to solve Q.3, 4 and 6 of Practice Time 1A.

ENHANCE

- Discuss ‘Fast Check’ given on page 8 in the classroom and motivate to solve it.
- Motivate and help the children to do the activity given in ‘Maths Fun’ on page 10.

[Critical Thinking]

Periods: 4–6	Topics: Numbers beyond 200, Counting in hundreds, Building numbers up to 999	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, dienes blocks up to 999, Number chart from 201 to 300, dice. Math Genius 2, Pages 12–16
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ENGAGE

Start the class by writing a few numbers up to 200 on the board, like 98, 140, 161, 182, etc. on the board. Ask: What will come just before 161? What will come just after 140? What will in between 161 and 163? Accept the responses. Ask, ‘what will come after 200?’ Introduce numbers beyond 200 through the activity discussed on page 12.



EXPLORE

Hang the number chart from 201 to 300 near to board or display it on smartboard.

Call the children of the class one by one near the board.

Give a die and ask to roll it and show the number to the class.

Instruct: To move ahead on the chart by the number they got on the die by reading the numbers loudly and mark the number. For example, if the number that occurred on the die is 3, then read the numbers 201, 202, and 203 and mark the number 203. Next children will start from 203 onwards. The children who did all his steps correctly will be appreciated. If 300 is reached, then restart from 201. Continue till time permits.

[Experiential Learning]

EXPLAIN

Explain counting of blocks in hundreds, as the number '100' is represented by 1 hundred block, written as 100 and read as one hundred and in the place value system, it is represented as shown alongside.

H	T	O
1	0	0

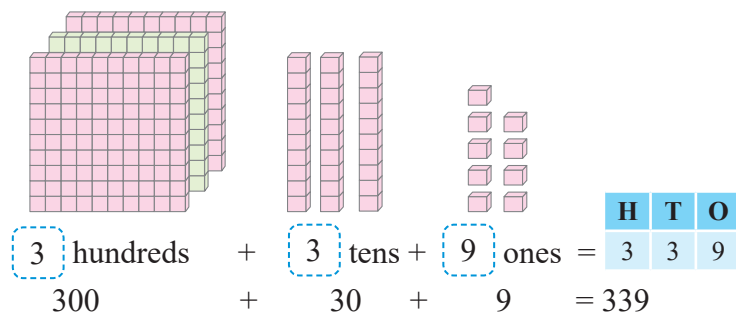
Similarly, show the representation of number 200, 300, ... up to 900 by taking the references given on page 13 of the textbook.

Further, explain building of numbers up to 999 using the dienes blocks.

ELABORATE

Demonstrate in the classroom the making of numbers like 339 by using the dienes blocks;

Like, show 3 hundred blocks in the classroom and ask: what number is this? Accept the responses. If any error, then rectify it. Further show 3 tens blocks and ask about the number formed. Then add 9 ones block and ask about the number formed using all the blocks together.



Also use the references and examples given on page 14 of textbook.

EVALUATE

Classwork: Ask the students to solve Q.1, 2 and 4 of Practice Time 1B

Homework: Ask the students to solve Q.3, 5–7 of Practice Time 1B.

ENHANCE

- Discuss the building of number '1000' in the classroom by taking the reference given on page 13 of the textbook.
- Motivate and help the children to do the activity given in 'Maths Fun' on page 15.

[Critical Thinking]

Periods: 7 – 10

**Topics: Numbers on the abacus,
Place value and Face value,
Expanded form and Standard
form of a number**

**Suggested extra teaching aids:
Blackboard or whiteboard, pens, pencils,
chalks/marker, notebook, dienes blocks
up to 999, Abacus, etc.
Math Genius 2, Pages 16–20**

ENGAGE

Take an abacus and place it on teachers table. Ask one by one about the 3 spikes. Which one is ones place spike, tens place or hundreds place spike on abacus. Accept the responses. Introduce representation of numbers on the abacus.

EXPLORE

Divide the class into groups and name them based on a colour-based animal name, like a white tiger, black panther, etc. Call one group and instruct one of them to think of any number of three digits. And they gave hints to their other group members as follows:

For example, if member A of group white tiger think about the number '126', he/she can give hints to their group member with help of teacher as,

- The number is more than 125 but less than 130.
- The digits at ones place is 6.

The other group member will identify the number and represent it on abacus with help of each other and the teacher. The process will continue with other groups. The group that performs the best will be the winner.

[Holistic Learning]

EXPLAIN

Describe that when there is no bead at any place on abacus, it means the digit '0' is in that place, by taking the reference given on page 17 of textbook. And the place value of a digit in the given number depends upon its place or position in the number. And the face value of any digit in a number is the digit itself.

The expanded form of a number is the sum of the place values of its digits. And the short form of a number is the numeral that is written using face value of the digits.

ELABORATE

Demonstrate on board the place values of digits of a number using abacus. As the number represent on abacus is 736. There are 6 beads on ones spike, so the place value of 6 is 6 ones or 6.

Similarly, place value of 3 and 7 are 3 tens or 30 and 7 hundreds or 700 respectively.

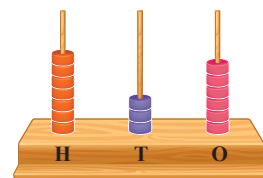
Demonstrate how the place value of each digit change when their positions change in the two numbers 367 and 736.

Demonstrate on board the expanded form and the short form of a number using the examples given on page 19 of the textbook.

EVALUATE

Classwork: Ask the students to solve Q.1 of Practice Time 1C and Q.2, 4 of Practice Time 1D.

Homework: Ask the students to solve the remaining questions of Practice Time 1C and 1D.



ENHANCE

- Discuss, motivate and help the children to solve the questions of ‘Think Tank’ and ‘Fast Check’ given on pages 17 and 18 respectively. **[Logical Critical Thinking]**

Periods: 11–14	Topics: Comparison of numbers, Ordering numbers, Formation of the smallest and greatest 3-digit numbers, Predecessor and successor	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, etc. Math Genius 2, Pages 20–26
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ENGAGE

Start the class with an interaction based on the previous concept. Ask: What will come just before 251? What will come just after 119? What will in between 500 and 502? Accept the responses? Write few pairs of numbers on the board. Ask: Which number is greater within the pair? Accept the responses. Introduce the comparison of numbers up to 999.

EXPLORE

Divide the class into pairs. Put some well-shuffled number chits having numbers up to 999 in a bowl. Instruct: Pick any 2 chits from the bowl and compare them. Ask: which number is greater? Accept the responses. Again, instruct to pick 2 more chits from the bowl. Ask: Which number is the biggest? Which number is the smallest? Accept the responses.

EXPLAIN

Discuss the meaning of symbols $<$, $>$ and $=$ by using the references and examples given on pages 20, 21 of the textbook.

Further, explain the rules of comparing numbers as follows:

- The number with more number of digits is greater than the number with less number of digits.
- When each of the given numbers is of same number of digits say 3 digits, then compare their hundreds digits first. When the digits in the hundreds place is same, then compare the digits in the tens place, and if the digits in the hundreds and tens places are same, then compare the digits in the ones place.

Explain that arranging numbers from the smallest to the greatest is called ascending order or increasing order. And arranging numbers from the greatest to the smallest is called descending order or decreasing order.

Further explain that, to form the greatest number by the given digits, we arrange the given digits in descending order. And to the smallest number, we arrange the given digits in ascending order.

Also discuss that predecessor of a number means a number which is 1 less than the given number. And successor of a number means a number which is 1 more than the given number.

ELABORATE

Demonstrate on board the rules of comparing numbers by taking the examples given on pages 21 and 22.

Also demonstrate arranging the numbers in ascending as well as in descending order by taking the references and examples on pages 23 and 24.

For formation of the greatest and smallest 3-digit numbers, demonstrate that the number formed, using the digits 4, 5 and 6 are 456, 465, 546, 564, 645, 654. Among these numbers the smallest number is: 456, in which the digits are arranged in ascending order and the greatest number is 654, in which the digits are arranged in descending order.



Also take the references and examples given on page 24 of the textbook.

Further, to demonstrate predecessor and successor, take the reference given on page 25.

EVALUATE

Classwork: Ask the students to solve Q.1 and 5 of Practice Time 1E, Q.1, 4 and 5 of Practice Time 1F.

Homework: Ask the students to solve the remaining questions of Practice Time 1E and 1F.

ENHANCE

- Discuss about ‘Zero’ given in the ‘Be aware’ section on page 24.
- Ask to solve the questions given in ‘Fast Check’ on page 25.

[Logical Thinking]

Periods: 15–16	Topics: Even and odd numbers, Ordinal numbers	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/ marker, notebook, flash cards of different numbers up to 3-digits, etc. Math Genius 2, Pages 26–30
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ENGAGE

Start the class by using some interesting activities like,

- Name the body parts that are in pair and that which are not in pair.
- Try to put the objects of your bag in pairs. Tell how many objects there are. Could you put them in pairs?

Accept the responses. Start the topic ‘Even and odd numbers’.

EXPLORE

Host a game show in your classroom. Write different numbers on flash cards and spread the cards on teachers table.

Call two students at a time and ask to select a card and turn it over. Then the students will race to the first student to raise their hand and correctly identify the number as odd or even will win a point. Rotate the students to come up so that every student has the opportunity to identify a number. Try using one-, two-, and if possible, three-digit numbers on the cards.

[Collaborative Learning]

EXPLAIN

All the numbers that can be put in pairs, that is, in groups of 2s are called even numbers. All the numbers that cannot be put in pairs, that is, in group of 2s are called odd numbers.

Further, recall the ordinal numbers up to 10 and link it with next ordinal numbers. Explain that the ordinal numbers are represented by the counting numbers by adding two letters at the end. For the number first, second and third we add the letters ‘st’, ‘nd’ and ‘rd’, respectively at the end and for other numbers we add ‘th’ at the end to write it as ordinal numbers.

The numbers that describe how many of something, such as one (1), two (2), three (3), four (4), ... are called cardinal numbers.

ELABORATE

Demonstrate on board the even and odd numbers by taking the references given on pages 26 and 27 of the textbook. Focus on the property that an odd number has 1, 3, 5, 7 or 9 at the ones place, and an even number has 0, 2, 4, 6 or 8 at the ones place.



Further, demonstrate the ordinal numbers and cardinal numbers by taking the references given on pages 28 and 29 of the textbook.

EVALUATE

Classwork: Ask to solve Q.1, 4 and 5 of Practice Time 1G and Q.1 of Practice Time 1H.

Homework: Ask to solve the remaining questions of Practice Time 1G and 1H.

ENHANCE

- Motivate to solve the ‘Challenge Question’ given on page 32.
- And help in doing ‘Gamified Learning’ given on page 33 of the textbook.

Periods: 17–18	Topic: Revision (Chapter assessment)	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, etc. Math Genius 2, Pages 31–33
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ENGAGE

Make students comfortable, so they can ask any question on any previously learnt topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLAIN

Start the revision of the exercise by using ‘Mental Maths’ and Chapter Assessment.

ELABORATE

Discuss and help the children to solve the ‘Mental Maths’ and questions of the ‘Chapter Assessment’. If they have any confusion or do any error then explain and correct it.

EVALUATE

Classwork: Discuss questions 1, 2 and 3 of the ‘Chapter Assessment’ and the ‘Project’ given on page 32.

Homework: Ask to do the rest of the questions of Chapter Assessment.

ENHANCE

Ask students to watch the video of ‘Numbers up to 999’ on ‘www.orangewebsupport.co.in’.



Addition

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand addition facts and properties of addition
- ◆ add numbers on a number line as well as on a number grid
- ◆ regroup ones to make tens
- ◆ add numbers without and with regrouping
- ◆ learn how to add three numbers in any order
- ◆ apply the concept in solving real life problems

LESSON PLAN

Suggested number of periods: 14

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, blocks up to 999, some real-life objects, pen, pencils, etc.

Keywords: Addition, Addition fact, Property of addition, Addend, Sum, Regroup, Plus, Total, Together.

Pre-requisite knowledge: Students must be familiar with sum of 1-digit and 2-digit numbers.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–3	Topics: Addition facts, Addition on the number line, Addition on the number grid	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/ marker, notebook, dienes blocks, ice-cream sticks, rubber band, number cards up to 20, etc. Math Genius 2, Pages 34–37
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ENGAGE

Introduce the topic in the classroom with some interesting activities, like asking questions on previously learned topics and then link to addition.

- Which number is the smallest 2-digit number?
- Which number is the largest 1-digit number?
- When you add both of them, which number you will get?

Accept the responses. Also discuss 'Get Ready' section given on page 34.

EXPLORE

Divide the class into pairs. Either draw a number line up to 40 on the ground using chalk or spread a number mat up to 40 or 50 on the floor. Call any pair randomly. Give them two number cards up to 0–20. Instruct to read the number and the first child will jump on the number line or on the grid of mat up to that number.

Then the second child will start from that number and jump forward as per the number on his/her number card.

Ask to identify the sum of two given numbers. Repeat with different pairs using different combinations of numbers. **[Experiential Learning]**

EXPLAIN

The symbol of addition is '+' (plus). The numbers to be added are called addends and the answer is called the sum.

Next, explain the properties of addition as follows:

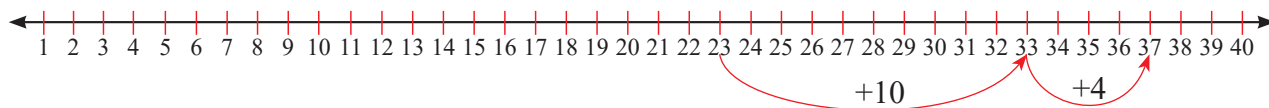
- When we add '0' to a number, we get the same number.
- When we add '1' to a number, we get the next number, *i.e.*, successor of the number.
- When we add two numbers in any order, we get the same sum each time.

Further, explain addition on number line by forward counting and on the number grid to add 10 we move down by one row and to add 1 we move right by one column.

ELABORATE

Demonstrate on board the addition facts, properties of addition by taking the references given on page 35 of the textbook.

Further, demonstrate the addition on number line, as $23 + 14$



Start from 23 and first count forward 10 steps. Then count 4 more, we reach at 37.

Thus, $23 + 14 = 37$.

The teacher can also take the references given on page 36 for addition on number line.

Further, discuss 'addition on the number grid' by taking the reference given on page 36.

[Experiential Learning]

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 2A.

Homework: Ask to solve Q.2 and 3 of Practice Time 2A.

ENHANCE

- Ask to solve 'Think Tank' and 'Fast Check' in the classroom.
- Motivate and help the children to solve the sum given in 'Maths Fun' section on page 37.

[Critical Thinking]

Periods: 4–10

Topics: Adding three 2-digit numbers, Regrouping of numbers, Addition with regrouping to make tens, Addition with regrouping to make more than tens, Adding more than two numbers with regrouping, Checking addition

Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, number arrow cards, etc. Math Genius 2, Pages 38–46

ENGAGE

Start the class by writing three 1-digit numbers on board, and ask the sum from the class. Motivate the children to do the sum on board. For the correct answer appreciate the child. Introduce the topic ‘Adding three 2-digit numbers’ by taking the real-life situation given on page 38.

EXPLORE

The teacher will revise the learners’ previous knowledge of the addition of two 2-digit numbers with the help of the following game.

- Divide the class into 2 teams. Distribute 10 arrow cards in which a digit is written on each card.
- Ask 3 children from team A to step forward in the front of the class.
- The teacher will ask one child to form a 2-digit number by using the arrow cards, say 35, and the other child will be asked to make a number by interchanging the digits, 53 and the third child will write the numbers on the board.
- Then the teacher will ask team B to find the sum of both numbers.
- Next, the teacher changes the role of teams.

[Collaborative Learning]

EXPLAIN

Explain addition of three two digit numbers, by using the blocks. When we join 10 ones we get a tens rod. We can add tens with ones by regrouping. Further explain addition with regrouping to make tens, addition with regrouping to make more than tens and adding more than two numbers with regrouping. At last explain the method of checking the addition.

ELABORATE

Discuss any real-life example and demonstrate addition of say 25, 22 and 31 by using the blocks.

First show the addition of ones by counting the ones blocks (5 ones blocks + 2 ones blocks + 1 ones block = 8 ones blocks).

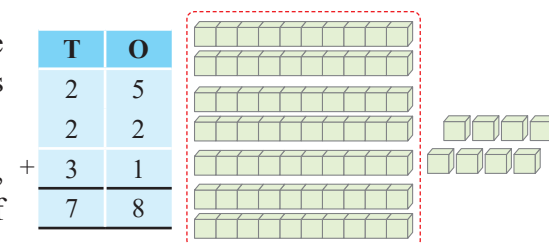
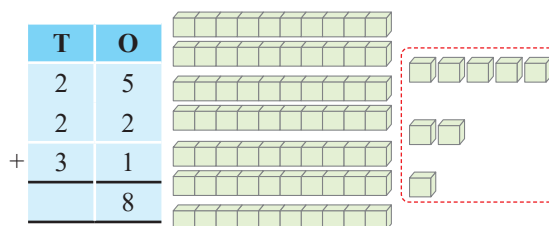
Next, show the addition of tens (2 tens + 2 tens + 3 tens = 7 tens).

Also, discuss the examples given on page 38.

Further, demonstrate that when we join 10 ones blocks, we get one tens. And adding tens with ones by regrouping using the examples given on pages 39 and 40 of the textbook.

Discuss addition with regrouping to make tens and more than tens, by using the references and examples given on pages 40–43 of textbook.

At last, demonstrate the method of checking whether the sum is correct or not by using the order property by taking the examples and few questions of exercise 2G given on page 46.



EVALUATE

Classwork: Ask to solve Q.1–4 of Practice Time 2B, Q.1 of Practice Time 2C, 2D, 2E, 2F and Q.1–4 of Practice Time 2G.

Homework: Ask to solve the remaining questions of Practice Time 2B–2G.

ENHANCE

- Discuss and ask to solve ‘Think Tank’ sections given on pages 43, 45 of the textbook.
- Take the worksheets/assignments from “www.orangewebsupport.co.in”. **[Critical Thinking]**

Periods: 11 – 12

Topic: Addition stories

Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, dienes blocks up to 999, Abacus, A4 paper sheets, etc. Math Genius 2, Pages 47–48

ENGAGE

Show any picture and ask the class what they are observing. Accept their responses then start the class by telling a number story like:

There are 4 children bicycling in the park and 10 children playing with ball in the park.

Ask: How many children are there altogether in the park?

Accept the answers. Introduce the topic ‘Addition stories’.

EXPLORE

Divide the class into groups of 4–5 children.

Distribute A4 sheets among the children in the class.

Write some addition problems on the board, like: $11 + 22$, $10 + 25$, etc.

Instruct each group to write one addition story with the help of each other using these numbers, and show the sum.

The group whose story is proper and sum is correct will be appreciated.

[Creative and Collaborative Learning]

EXPLAIN

Discuss the way to extract the correct information from the given addition story or word problem. Write equations to represent word problems, and identify the method to solve the problem.

ELABORATE

Demonstrate on board the method to understand, write the equations and solve the problems given in ‘Addition stories’ by using the example and few questions of Practice Time 2H given on pages 47 and 48 of the textbook.

EVALUATE

Classwork: Ask to solve Q.1–3 of Practice Time 2H.

Homework: Ask to solve Q.4–6 of Practice Time 2H.

ENHANCE

- Ask to solve ‘Mental Maths’ and ‘Challenge Question’ given on pages 48 and 50 of the textbook.
- Instruct to download some addition stories worksheet from internet and practise it.



Periods: 13–14

Topic: Revision (chapter assessment)

Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook. Math Genius 2, Pages 49–50

ENGAGE

Make students comfortable, so they can ask any question on any previously learnt topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’.

ELABORATE

Discuss and help the children to solve questions of the ‘Chapter Assessment’. If they have any confusion or do any error then explain and correct it.

EVALUATE

Classwork: Discuss questions 1, 2 and 3 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to do the rest of the questions of ‘Chapter Assessment’ as homework assignment.

ENHANCE

- Ask and help to do the activity given in ‘Gamified Learning’ on page 50 of the textbook
- Ask students to watch the video of ‘Addition’ for grade 2 on ‘www.orangewebsupport.co.in’.



Subtraction

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand subtraction fact and properties of subtraction
- ◆ subtract two numbers using a number line and a number grid
- ◆ regroup numbers for subtraction
- ◆ subtract numbers without and with regrouping
- ◆ check the answer of subtraction using addition
- ◆ establish a relation between addition and subtraction
- ◆ apply the concept of subtraction in real life problems

LESSON PLAN

Suggested number of periods: 14

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, dienes blocks up to 999, some real-life objects, pen, pencils, etc.

Keywords: Take away, Minus, Minuend, Subtrahend, Difference, Addition facts, Subtraction facts.

Pre-requisite knowledge: Students must be familiar with subtraction of two 1-digit numbers, a 1-digit number from a 2-digit number, etc.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–3	Topics: Subtraction facts, Subtraction on the number line, Subtraction on a number grid	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/ marker, notebook, dienes blocks, ice-cream sticks, rubber band, number cards up to 50, etc. Math Genius 2, Pages 51–55
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ENGAGE

Introduce the topic in the classroom with some interesting activities, like asking questions on previously learned topics and then link to subtraction.

- Which number is the smallest 2-digit number?
- Which number is the largest 1-digit number?

- Can you subtract the smallest 2-digit number from the greatest 1-digit number?
- If you subtract the greatest 1-digit number from the smallest 2-digit number, which number will you get?

Accept the responses. Also discuss ‘Get Ready’ given on pages 51 and 52 and help to complete the statement.

EXPLORE

Divide the class into pairs. Either draw a number line up to 40 on the ground using chalk or spread a number mat up to 100 on the floor. Call any pair randomly. Give them two number cards up to 50. Instruct to read the number and the first child will jump on the number line or on the grid of mat up to that number.

Then the second child will start from that number and jump backward as per the number on his/her number card.

Ask to identify the difference of two given numbers. Repeat with different pairs using different combinations of numbers. **[Experiential Learning]**

EXPLAIN

The symbol of subtraction is ‘-’ (minus). Let them recognise a subtraction fact and its terms. The number from which we subtract another number is called **minuend**. The smaller number that is to be subtracted is called the **subtrahend**, and the answer of subtraction is called the **difference**.

Next, explain the properties of subtraction as follows:

- When we subtract ‘0’ from a number, the difference is the number itself.
- When we subtract ‘1’ from a number, the difference is the number that comes just ‘before’ the subtracting number, *i.e.*, predecessor of the number.
- When we subtract a number from itself, the difference is ‘0’.

Further, explain subtraction on the number line by backward counting and on the number grid to subtract 10 we move up by one row and to subtract 1 we move left by one column.

ELABORATE

Demonstrate on board the subtraction facts, properties of subtraction by taking the references given on pages 52 and 53 of the textbook.

Further, demonstrate the subtraction $26 - 15$ on the number line as



Start from 26 and count backward 15 steps. We reach at 11.

Thus, $26 - 15 = 11$.

Also take the references given on page 53 for subtraction on the number line.

Further, demonstrate ‘subtraction on a number grid’ by taking the reference and example given on page 54.

[Experiential Learning]

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 3A and ‘Fast Check’ given on page 54.

Homework: Ask to solve Q.2 of Practice Time 3A.

ENHANCE

- Ask to read aloud the content of ‘Maths Connect’ given on page 53 and solve it.
- Motivate and help the children to solve the sum given in ‘Life Skills’ given on page 53.

[Cross Curricular Learning]

Periods: 4–7	Topics: Regrouping numbers for subtraction, Subtraction with regrouping	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, number arrow cards, etc. Math Genius 2, Pages 55–58
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ENGAGE

Start the class by recalling the regrouping of ones to tens. And then demonstrate that similarly we can regroup 1 ten to 10 ones. Introduce the topic ‘Regrouping numbers for subtraction’.

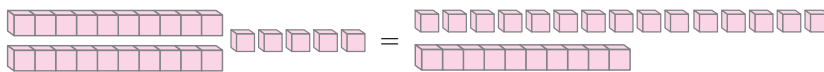
EXPLORE

Teacher will use the activity given in ‘Gamified Learning’ given on page 66 of the textbook to make the understanding of subtraction of 2-digit numbers with regrouping.

[Experiential Learning]

EXPLAIN

After revising the subtraction of two-digit numbers by activity, discuss that sometimes, when there are not enough ones to subtract from, we regroup the numbers. For example, 25 tens can be regrouped into 1 ten and 15 ones.



Use the references and examples of ‘regrouping numbers for subtraction’ explained on page 55.

Next, describe the ‘subtraction with regrouping’ using the real-life situation and the method given on pages 56, 57 and 58 of the book.

ELABORATE

Demonstrate on board the process of regrouping and subtraction of 1-digit number from a 2-digit number $34 - 8$ as follows:

Since $4 < 8$, borrow 1 ten from 3 tens, the 3 tens will become 2 tens and regroup 4 ones into 14 ones.

Subtract the ones.

Since $14 - 8 = 6$, write 6 in ones column.

Next subtract the tens. $2 - 0 = 2$, write 2 in tens column.

Further, demonstrate subtraction of two 2-digit numbers by taking the references and examples given on pages 57 and 58 of the textbook.

T	O
(2)	(14)
3	4
	8
2	6

EVALUATE

Classwork: Ask to solve Q.1 and 2 of Practice Time 3B, Q.1 (a), (b) and 2 (a)–(d) of Practice Time 3C.

Homework: Ask to solve the remaining questions of Practice Time 3B and 3C.

ENHANCE

- Discuss and ask to solve ‘Think Tank’ section given on pages 55 and 58 of the textbook.

[Critical Thinking]

Periods: 8 – 10	Topics: Checking subtraction with addition, Relation between addition and subtraction, Finding the missing number	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, crayons/colour pencils, etc. Math Genius 2, Pages 60–62
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ENGAGE

Start the class by creating a situation, such as: if you have a packet of 20 pencils, and you distribute 12 pencils to your friends, then how many pencils have you left, 7 or 8? How can you check which is the correct answer? Introduce the topic ‘Checking subtraction with addition’.

EXPLORE

The following activity is used by the teacher to reinforce the concept of 2-digit subtraction.

Divide the class into groups of 4–5 children each.

Instruct to do the activity given in ‘Maths Fun’ section on page 59 of the textbook with help of other members of the group.

The group that completes the activity first will be the winner.

[Collaborative Learning and Art Integration]

EXPLAIN

Explain that to check whether the difference of minuend and the subtrahend is correct or not we add the difference and the subtrahend, if it is equal to minuend, then our difference is correct, *i.e.*, Difference + Subtrahend = Minuend

Further, explain the relation between addition and subtraction. Note that if we change the order of addends it does not affect the sum and for every addition fact we have two corresponding subtraction facts. Also, demonstrate the finding of missing number by using the addition fact and subtraction fact.

ELABORATE

Demonstrate on board ‘Checking subtraction with addition’ by taking the references and examples given on page 60.

Further, demonstrate how ‘addition and subtraction’ are inter-related to each other. For this, consider three numbers 6, 9 and 15 and explain that, if we change the order of addends 6 and 9 it does not affect the sum 15. Also, show that for every addition fact we have two corresponding subtraction facts.

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Next, describe the way to ‘find the missing number’ by using the addition and subtraction fact.

For example, what should be added to 12 to get 20?

We can write the statement as an equation: $12 + \underline{\quad} = 20$

Now, write the corresponding subtraction fact to this addition fact as: $20 - 12 = 8$

So, 8 should be added to 12 to get 20.



EVALUATE

Classwork: Ask to solve Q.1–2 of Practice Time of 3D, 3E and 3F.

Homework: Ask to solve the remaining questions of 3D, 3E and 3F.

ENHANCE

- Discuss ‘Challenge Question’ given on page 59.
- Encourage students to do the ‘Activity’ given on page 62.

Periods: 11–12

Topic: Subtraction stories

**Suggested extra teaching aids:
Blackboard or whiteboard, pens,
pencils, chalks/marker, notebook, etc.
Math Genius 2, Pages 63–64**

ENGAGE

Start the class with an interaction based on children’s real life experience. Then, tell a number story like: Riya has 12 candies with her. If she gives 8 to her friend Siya, how many candies are left with her?

Accept the answers. Introduce the topic ‘Subtraction stories’.

EXPLORE

Divide the class into groups of 4–5.

Distribute A4 sheets among the children in the class.

Write some subtraction problems on the board, like: $22 - 10$, $25 - 10$, etc.

Instruct each group to write one subtraction story with the help of each other using these numbers, and show the difference.

The group whose story is proper and the difference is correct will be appreciated.

[Creative and Collaborative Learning]

EXPLAIN

Discuss the way to extract the correct information from the given subtraction story or word problem. Write equations to represent word problems, and identify the method to solve the problem.

ELABORATE

Demonstrate on board the method to understand, write the equations and solve the problems given in ‘Subtraction stories’ by using the examples and few questions of Practice Time 3G given on pages 63 and 64 of the textbook.

EVALUATE

Classwork: Ask to solve Q.1–3 of Practice Time 3G.

Homework: Ask to solve Q.4–6 of Practice Time 3G.

ENHANCE

- Ask to solve ‘Mental Maths’ given on page 64 of the text book.
- Instruct to download some subtraction stories worksheet from internet and practise it.



Period: 13–14

Topic: Revision (Chapter Assessment)

**Suggested extra teaching aids:
Blackboard or whiteboard, pens, pencils,
chalks/marker, notebook, etc.
Math Genius 2, Page 65**

ENGAGE

Make students comfortable, so they can ask any question on any previously learnt topics in which they are confused. Clarify their doubts of queries and start the revision of the exercise.

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’.

ELABORATE

Discuss and help the children to solve questions of the ‘Chapter Assessment’. If they have any confusion or do any error then explain and correct it.

EVALUATE

Classwork: Discuss questions 1, 2 and 3 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to do the rest of the questions of ‘Chapter Assessment’ as homework assignment.

ENHANCE

- Ask students to watch the video of ‘Subtraction’ for grade 2 on ‘www.orangewebsupport.co.in’.



Addition and Subtraction

Learning Objectives

After studying this chapter, students will be able to...

- ◆ add bigger 2-digit numbers
- ◆ add 3-digit numbers without and with regrouping
- ◆ subtract 3-digit numbers without and with regrouping
- ◆ apply addition and subtraction to solve real life problems

LESSON PLAN

Suggested number of periods: 12

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, blocks up to 999, some real-life objects, pen, pencils, etc.

Keywords: Addends, Sum, Minuend, Subtrahend, Difference, Addition facts, Subtraction facts, Plus, Minus.

Pre-requisite knowledge: Students must be familiar with addition and subtraction two of 1-digit numbers, a 1-digit number from a 2-digit number, Two 2-digit numbers.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–5	Topics: Addition of bigger 2-digit numbers, Addition of 3-digit numbers without regrouping, Addition of 3-digit numbers with regrouping, Addition stories	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/ marker, notebook, some paper chit/flash cards with addition sum or subtraction sum, etc. Math Genius 2, Pages 67–76
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ENGAGE

Start the class by discussing the ‘Get Ready’ section given on pages 67 and 68.

Ask to solve the questions. Accept the responses. Start the topic ‘Addition of bigger 2-digit numbers’.

EXPLORE

Divide the class into groups of 4 students each. Place four bowls on the teacher’s table. In the 1st bowl, keep some 2-digit number cards, and in the 2nd to 4th bowl, put their decomposition into the addition statement or subtraction statement.

Example: For the number 52, the decompositions into addition statement or subtraction statement are $30 + 10 + 12$, $74 - 22$, $30 + 20 + 2$, etc.

Ask one student of the group to take out a 2-digit number from the first bowl, and the other students will find the correct matched addition and subtraction statements in the other bowls.

They will paste it on the sheet of a paper. For any confusion, the teacher will help.

Repeat this activity with other groups with different 2-digit numbers. The team that completes each task quickly and correctly will be commended. **[Experiential and Collaborative Learning]**

EXPLAIN

Sometimes when we add two 2-digit numbers, we get the sum as a 3-digit number. Recall the addition of 2-digit, numbers and link it to the numbers, when the sum is of a 3-digit number. Use the references and examples given on pages 68 and 69.

Further, explain addition of 3-digit numbers without regrouping and discuss when we have more than 9 ones, say 12 ones, we can regroup 12 ones into 1 ten and 2 ones and when we have more than 9 tens, say 11 tens we can regroup it into 1 hundred and 1 ten and so on. We use this method of regrouping in addition. The teacher can use dienes blocks to demonstrate the addition visually.

Next, explain the way to extract the correct information from the given addition story or word problem. Write equations to represent word problems, and identify the method to solve the problem.

ELABORATE

Demonstrate on board the sum of two and three 2-digits numbers, whose sum is a 3-digit number by taking the reference and examples given on pages 68 and 69 of the textbook.

Further demonstrate, how to add two 3-digit numbers and three 2- or 3-digit numbers by discussing the real life situation given on pages 71–72 of the textbook without regrouping.

Next, demonstrate ‘addition of 3-digit numbers with regrouping’ by using the real life situation and examples given on pages 73 and 74 of the textbook.

Also demonstrate on board the method to understand, write the equations and solve the problems given in ‘Addition stories’ by using the examples given on page 75 of the textbook. **[Conceptual Learning]**

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 4A, 4B and Q.1–3 of Practice Time 4C and 4D.

Homework: Ask to solve the remaining questions of Practice Time 4A–4D.

ENHANCE

- Motivate and help the children to solve the sum given in ‘Think Tank’ and ‘Maths Connect’ given on pages 69 and 70 respectively.
- Ask to solve the sum and perform the activity given in ‘Maths Fun’ on page 71 of the textbook.
- Discuss ‘Fast Check’ and solve ‘Challenge Question’ given on pages 74 and 76 respectively.

[Cross Curricular Learning]



Periods: 6–10

Topics: Subtraction of 3-digit numbers without regrouping, Subtraction of 3-digit numbers with regrouping, Subtraction stories, Checking subtraction using addition

Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, number arrow cards, etc. Math Genius 2, Pages 76–84

ENGAGE

Start the class by revising two 2-digit subtraction problem. Link it into two 3-digit subtraction. Introduce the topic ‘Subtraction of 3-digit numbers without regrouping’.

EXPLORE

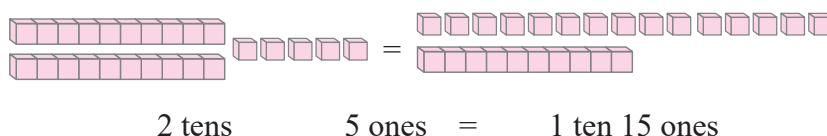
The teacher will revise the learner’s previous knowledge of subtraction of 2-digit numbers with the help of the following activity.

- Divide the class into 2 teams. Distribute 10 arrow cards in which a digit is written on each card.
- Ask 3 children from team A to step forward in the front of the class.
- The teacher will ask one child to form a 2-digit number by using the arrow cards, say 48, and the other child will be asked to make a number by interchanging the digits, 84 and the third child will write the numbers on the board.
- Then the teacher will ask team B to find the difference of both numbers.
- Next, the teacher changes the role of teams.

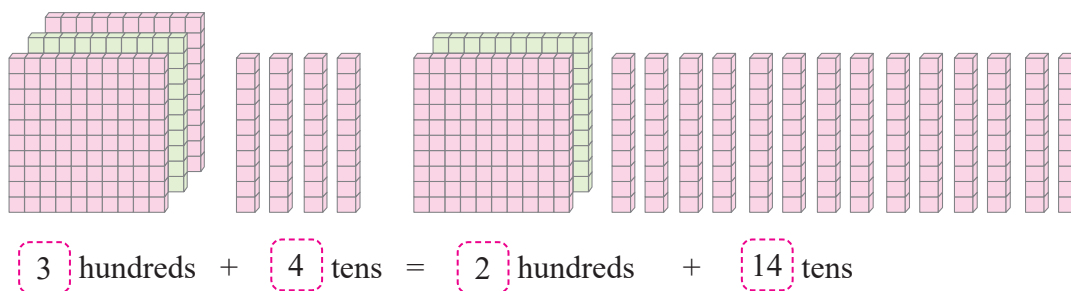
[Experiential Learning]

EXPLAIN

After revising the subtraction of two digits by activity, discuss that sometimes, when there are not enough ones to subtract from, we regroup the numbers. For example, 25 tens can be regrouped into 1 ten and 15 ones.



Similarly, we can regroup hundreds into tens if required.



Use the references and examples of regrouping tens, hundreds and both hundreds and tens as given on pages 78, 79 and 80 respectively. Next, discuss the way to extract the correct information from the given subtraction story or word problem. Write equations to represent word problems, and identify the method to solve the problem. At last explain that as 2-digit subtraction we can also check the subtraction of 3-digit numbers using addition as:

Difference + Subtrahend = Minuend.

ELABORATE

Talk about any real life situation where we need to subtract two numbers. For example, a school invited 865 parents/guests for viewing the annual Day celebration. But only 640 guests/parents could attend the function. How many did not come? It can be solved on the board as shown here. Teacher can also demonstrate the methods to solve the examples given on pages 76 and 77 of the textbook on board.

H	T	O	
8	6	5	← No. of guests/parents invited
6	4	0	← No. of guests/parents attended
2	2	5	

Further, demonstrate on board the ‘subtraction of 3-digit numbers with regrouping’ tens, hundreds and hundreds and tens using the references and examples given on pages 78, 79 and 80. Also demonstrate that when zeros are in the minuend, subtracting 1 from minuend and subtrahend both makes the subtraction easier. For example,

H	T	O	
	9		
7	10	10	
8	0	0	
2	5	6	
5	4	4	

and

H	T	O		H	T	O
8	0	0	→ -1	7	9	9
2	5	6	→ -1	2	5	5
				5	4	4

[Conceptual Learning]

Also, demonstrate on board the method to understand, write the equations and solve the problems given in ‘Subtraction stories’ by using the examples given on page 82 of the textbook.

And as we have learnt checking subtraction by using addition for 2-digit numbers. We do the same for 3-digit numbers by using the example given on page 83 of the textbook.

EVALUATE

Classwork: Ask to solve Q1 of Practice Time 4E, 4F and Q1–3 of Practice Time 4G and Q1 of Practice Time 4H.

Homework: Ask to solve the rest of the questions of Practice Time 4E – 4H.

ENHANCE

- Discuss and ask to solve ‘Think Tank’ given on page 79 of the textbook.
- Also discuss ‘Maths Fun’ and ‘Life Skills’ given on pages 81 and 83 respectively.

[Critical Thinking]

Periods: 11 – 12	Topic: Revision (Chapter assessment)	Suggested extra teaching aids: Blackboard or whiteboard, pens, pencils, chalks/marker, notebook, crayons/colour pencils, etc. Math Genius 2, Pages 85–86
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ENGAGE

Make students comfortable, so they can ask any question on any previously learnt topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLAIN

Start the revision of the exercise by using the ‘Chapter Assessment’.

ELABORATE

Discuss and help the children to solve questions of the ‘Chapter Assessment’. If they have any confusion or do any error then explain and correct it.

EVALUATE

Classwork: Discuss questions 1, 2 and 3 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to do the rest of the questions of ‘Chapter Assessment’ as homework assignment.

ENHANCE

- Ask to solve the questions given in ‘Mental Maths’. **[Critical Thinking]**
- Ask students to do the activity given in ‘Gamified Learning’ on page 86 of the textbook. **[Experiential and Collaborative Learning]**



Multiplication

Learning Objectives

After studying this chapter, students will be able to...

- ◆ know multiplication as repeated addition
- ◆ learn to do skip counting
- ◆ multiply two 1-digit numbers horizontally and vertically
- ◆ multiply 2-digit number by a 1-digit number without and with regrouping
- ◆ solve real life problems using multiplication
- ◆ read and write multiplication tables up to 10
- ◆ understand properties of multiplication

LESSON PLAN

Suggested number of periods: 13

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some real-life objects like sketch pens, pens, pencils, number arrow cards. Times table chart, etc.

Keywords: Multiplicand, Multiplier, Product, Multiplication fact, Repeated addition, Times table, Skip counting.

Pre-requisite knowledge: Students must be familiar with the multiplication table of 1, 2, 5 and 10, and multiplication of 1-digit numbers by 1-digit number.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–5

Topics: Repeated addition, Multiplication tables, Properties of multiplication

Suggested extra teaching aids: Some real-life objects, chart of multiplication tables up to 10, etc. Math Genius 2, Pages 87–100

ENGAGE

Introduce the topic by asking to recite the multiplication tables of 1, 2, 5 and 10 in chorus. Appreciate the children. Again, discuss and instruct to complete the ‘Get Ready’ section given on pages 87–88. Introduce multiplication as repeated addition.

EXPLORE

Divide the class into groups. Distribute some ice-cream sticks to each of them. Instruct to arrange them in groups by adding two sticks in each time. (Start with 2 sticks and make groups by adding 2 sticks), keep them in sequence, as 2 sticks, 4 sticks, 6 sticks, 8 sticks, and so on. Again ask count the number of sticks in each group and write their number in your notebook in sequence and observe these numbers.

Ask: How many numbers are skipped between two numbers? Accept the responses.

Similarly, it can be extended for 3, 6, 9, ..., 4, 8, 12, and 5, 10, 15,

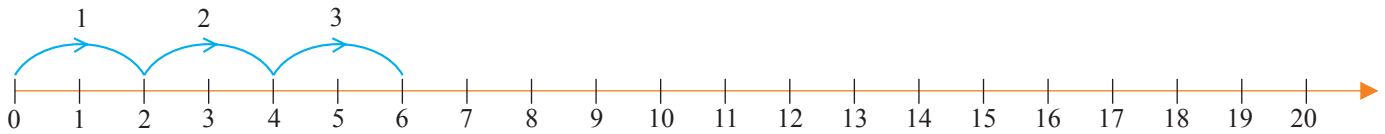
[Experiential Learning]

EXPLAIN

Explain to the students that repeated addition can be also represented as multiplication.

Write the skip counting in 2s, skip one number in between two numbers, as 2, 4, 6, 8, 10, 12, ..., etc.

To show the skip counting in 2s on a number line, jump 2 numbers each time. As,



Start from 0. Jump on every second number by skipping the next number as shown in the above figure, and write the next number.

Similarly, discuss that for the skip counting of 3, 4, 5, 6, 7, 8, 9 and 10, we have jumped on and write every third, fourth, fifth, sixth, seventh, eighth, ninth and tenth numbers respectively. Further, link this skip counting to times table correspondingly by taking the references of pages 90 to 96 of the textbook. Motivate the students to learn them by writing in their notebooks.

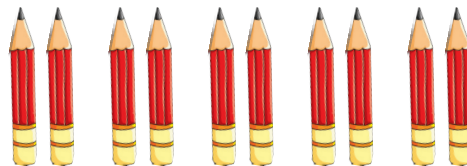
Next, discuss the ‘properties of multiplication’ as:

- Product of two numbers remains same even if we change the order of the numbers to be multiplied.
- If we multiply any number by 1, we get the same number.
- If we multiply any number by 0, we always get the product as 0.

Also, discuss ‘double’ means two times or twice of a number.

ELABORATE

Place 10 concrete objects like pencils on the table as follows:



Explain that here, we have 5 groups of 2 pencils each *i.e.*, $2 + 2 + 2 + 2 + 2 = 10 = 5 \times 2 = 10$

$5 \times 2 = 10$ is read as ‘5 into 2 is 10’ or ‘5 multiplied by 2 is 10’ or ‘5 times 2 is 10’.

$5 \times 2 = 10$ is called the multiplication fact or multiplication statement.

Here, ‘ \times ’ is the sign of multiplication. And the repeated addition is the multiplication.

Motivate the class to complete and read the times table of 2, 3, 4, 5, 6, 7, 8, 9 and 10 in chorus and remember it. Further, demonstrate the multiplications on the number line by taking the reference and example given on pages 90 to 93.

[Experimental Learning]

EVALUATE

Classwork: Instruct the class to do Q.1 of Practice Time 5A, Q.1, 2 and 3 of Practice Time 5B, and Q.1 of Practice Time 5C in the classwork.

Homework: Solve the rest of the questions of Practice Time 5A to 5C.

ENHANCE

- Ask to do the activities given in ‘Maths Fun’ on page 96 and ‘Activity’ on page 100.
- Discuss and ask to solve ‘Think Tank’ given on page 99.



ENGAGE

In the beginning, put the chart of tables in front of students. So, they can memorise the tables. Then recall one-digit multiplication by using the multiplication table. As,

$$5 \times 5 = 25; \quad 8 \times 7 = 56; \quad 9 \times 8 = 72; \quad 8 \times 8 = 64 \text{ and so on.}$$

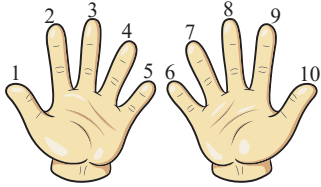
EXPLORE

The teacher can introduce a quick method of multiplication of any number by 9 using fingers as follows:

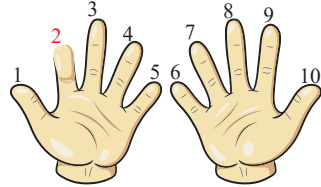
For example, to multiply 9 by 2,

Place your hands side by side, palms facing you. As 9 is multiplied by 2, fold the finger number 2. Next, count the number of fingers to the left of the folded finger (there is 1) and then the number of fingers to the right of the folded finger (there are 8). So, the result of multiplying 9×2 is 18.

Step 1: $9 \times 2 = ?$



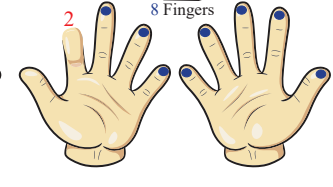
Step 2: $9 \times 2 = ?$



Step 3: $9 \times 2 = 1$



Step 4: $9 \times 2 = 18$



[Experiential Learning]

EXPLAIN

Explain that vertical multiplication is another way to multiply the numbers. In this method, we write a number below another number. The number to be multiplied is called the **multiplicand** and the number by which it is multiplied is called the **multiplier**. The answer is called the **product**. Then start the explanation of multiplication of 2-digit numbers by 1-digit numbers without regrouping and then move to the multiplication of 2-digit numbers by 1-digit numbers with regrouping. Further, explain the process of multiplication with regrouping.

ELABORATE

First, make the students, revise their knowledge of multiplication by writing the question on the board ‘multiply 6 by 2’.

Demonstrate on board that we multiply two numbers vertically as shown, the number to be multiplied is called the **multiplicand** and the number by which it is multiplied is called the **multiplier**. The answer is called the **product**.

T	O	
6		← Multiplicand
2		← Multiplier
1	2	← Product

Demonstrate the method of solving the example and few questions given in ‘Practice Time 5D’ based on real life situation where we use multiplication to solve it, given on page 101 and 102 of the textbook. Further, demonstrate the

Multiplication of 2-digit number by a 1-digit number as follows:

Write on board: Multiply 23 by 2.

Arrange the numbers in their place value columns on board.

- Multiply the ones by 2 and write the product at the ones place of the product.
- Multiply tens by 2 and write the product at the tens place of the product.

T	O	
2	3	← Multiplicand
	2	← Multiplier
4	6	← Product

Next, demonstrate the multiplication with regrouping, starting with regrouping ones. When we have more than 9 ones after multiplication, then we regroup the ones into tens and ones and carry over the tens to tens column.

Further, demonstrate when we have more than 9 tens, we regroup it to hundreds and tens and carry over the hundreds to the hundreds column.

Similarly, we can regroup both ones and tens. For elaborated explanation, use the method and examples given on pages 103–105 of the textbook.

[Conceptual Learning]

T	O
①	
2	6
×	3
7	8

H	T	O
①		
	5	3
×		3
1	5	9

H	T	O
③	③	
	6	7
×		5
3	3	5

EVALUATE

Classwork: Ask the students to solve Q.1, (a), (b), Q.2 of Practice Time 5D, Q. 1 to 4 of Practice Time 5E and Q. 1 and 2 of Practice Time 5F in the classwork. If the students make any error while doing the multiplication, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 5D to 5F as homework assignment.

ENHANCE

- Ask to solve questions of ‘Think Tank sections given on pages 101 and 105.

Period: 11	Topic: Multiplication stories	Suggested extra teaching aids: Multiplication chart table, pair of dice, number grid chart, etc. Math Genius 2, Pages 106–107
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ENGAGE

Start the class by asking a question like: If you have to distribute 2 candies to each of your 8 friends, how many candies would you require? Accept the answers. Introduce the topic ‘Multiplication stories’.



EXPLORE

Teacher will guide to perform an activity based on dice game for multiplication, to revise the multiplication.

Divide the class into group provide a pair of dice and a game board as shown here. Then instruct them as follows:

- Roll a pair of dice.
- Multiply both the numbers.
- Colour the product in the number grid.
- The group that colours 5 numbers in a row first will be the winner.

[Experimental Learning]

30	12	15	10	2
25	18	24	8	16
9	20	5	36	4
24	15	12	9	10
6	8	20	25	36
18	12	9	16	24

EXPLAIN

Discuss the way to extract the correct information from the given multiplication stories or word problems. Explain how to identify that which mathematical operation: addition, subtraction or multiplication is required to solve the problem. Write equations to represent word problems, and identify the method to solve the problem.

ELABORATE

Demonstrate on board the example and few questions of Practice Time 5G of the textbook.

[Conceptual Learning]

EVALUATE

Classwork: Ask to solve problems Q.1 (a), (b) and (c) and Q.2 (a) of Practice Time 5G. If the students make any error while solving the problems, the teacher will correct it and explain.

Homework: Ask the solve the remaining questions of Practice Time 5G as their homework assignment.

ENHANCE

- Download worksheets on the multiplication of a 2-digit number by a 1-digit Number from the internet with the help of parents and practise them.

Periods: 12–13

Topic: Revision (Chapter Assessment)

Suggested extra teaching aids: Textbook Math Genius 2, Pages 108–110

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Guide them to perform the activity as suggested in ‘Gamified Learning’ section on page 110 in the classroom.

EXPLAIN

Start the revision of the exercise by using ‘Life Skills’, ‘Mental Maths’, ‘Challenge Question’ and ‘Chapter Assessment’.

ELABORATE

Discuss questions 1 to 4 of the ‘Chapter Assessment’ and accept students answer. If they have any confusion or they are making errors, then explain and correct them. Discuss ‘Challenge Question’ and motivate students to solve ‘Mental Maths’.

EVALUATE

Classwork: Discuss questions 1 to 4 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to solve Q.5 and 6 of ‘Chapter Assessment’.

ENHANCE

- Ask students to find the processes of multiplication other than those discussed in the book, with the use of the internet or with the help of friends, teachers and parents.
- Ask to watch video on multiplication on www.orangewebsupport.co.in.



Division

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand the concept of division as equal sharing and grouping
- ◆ explain division by repeated subtraction
- ◆ understand the relation between multiplication and division
- ◆ know the terms associated with division
- ◆ divide a number using long division method
- ◆ solve real life problems using division
- ◆ divide a number on a number line
- ◆ divide a number using multiplication tables

LESSON PLAN

Suggested number of periods: 14

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some real-life objects like sketch pens, pens, pencils, number arrow cards, times table chart, bowl, etc.

Keywords: Grouping, Sharing, Distribution, Repeated Subtraction, Division fact, Dividend, Divisor, Quotient, Remainder.

Pre-requisite knowledge: Students must be familiar with the multiplication tables of 1 to 10, and sharing things equally among a certain number of groups.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–5

Topics: Division as equal sharing, division by equal grouping, division by repeated subtraction, Division of a number on a number line

Suggested extra teaching aids:
Some real-life objects
Math Genius 2, Pages 112–118

ENGAGE

Put 10 candies on the teacher's table. Call any pair of students to divide the 10 candies among themselves equally. Repeat the same with different number of candies and different pairs of students. Accept the responses. Introduce the topic 'Division as equal sharing'.

Can take the situation given in 'Get Ready' and discuss its solution.

EXPLORE

Use the activity given on page 112 to introduce division to the class.

[Experiential Learning]



EXPLAIN

If 10 candies are shared among 2 friends, then each child will get 5 candies. We can write it as $10 \div 2 = 5$, this is called division statement or division fact. Take the reference of the real life example given on page 112 of the textbook to explain the division as equal sharing.

Explain that division can also express as equal grouping, by taking the reference of real life example given on page 114 of the textbook.

Further explain that repeated subtraction can also be used for division by taking the reference of example given on page 116.

Similarly, we can use the number line to represent the division as repeated subtraction. Use the example given on page 117 of the textbook for detailed explanation.

ELABORATE

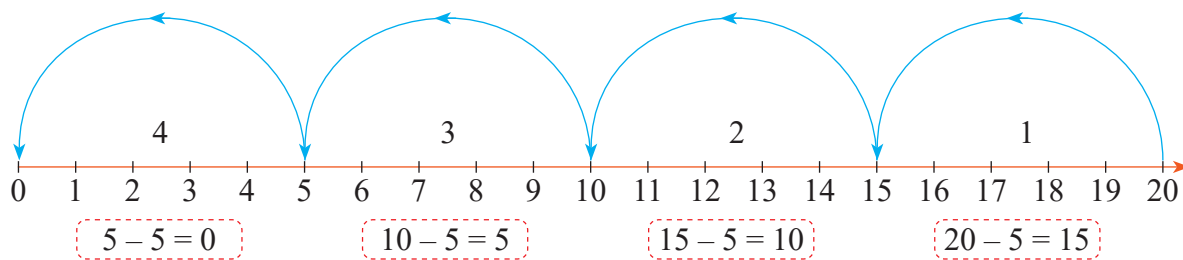
Call one boy/girl and give him/her few pencils. Instruct to share equally among the students of the class including himself/herself. Ask: How many pencils does each student get? Accept the responses. Now, instruct the class to write it as division sentence using division sign.

Next, divide the class into groups. Give them few different number of marbles to each group. Instruct to divide within the group equally. Ask: How many marbles does each get? Instruct them to write division sentence for the distribution of marbles.

Further, keep a jar on the teacher's table and fill with even number of candies. Instruct: Pick out 2 candies at a time and empty the jar. Ask: How many times did you pick it out? Accept the responses. Repeat with other numbers. Discuss division by repeated subtraction using examples on blackboard.

To demonstrate the division on number line, take students to playground. Make number line 0-20 by using chalk or sand. For example, to teach them division of 20 by 5. Instruct: Start from 20 and jump by skipping 5 numbers each time till you reach at 0.

Ask: How many times did you jump? Accept the responses. Demonstrate the same concept on the board as:



Thus, $20 \div 5 = 4$.

[Holistic Learning]

EVALUATE

Classwork: Instruct the class to do Q.1 and 2 of Practice Time 6A, Q.1 and 2 of Practice Time 6B, and Q.1 of Practice Time 6C in the classwork.

Homework: Ask to solve the rest of the questions of Practice Time 6A, 6B and 6C in the homework.

ENHANCE

- Discuss and ask to solve 'Think Tank' given on page 114.

Periods: 6–10

Topics: Relation between division and multiplication, Division using multiplication tables, Terms of a division statement, Long division method, Division with remainder

Suggested extra teaching aids: Multiplication table chart, some real life objects, some cards showing facts family, etc. Math Genius 2, Pages 118–123

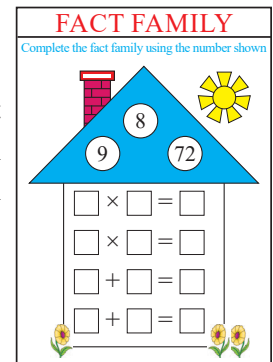
ENGAGE

Start the class by placing three bowls on the teacher’s table. Put 2 erasers on each bowl. Ask: What is the total number of erasers? Accept the responses. Again ask the division statement and multiplication statement for this observation. Introduce the relation between division and multiplication.

EXPLORE

Divide the class into groups. Distribute facts family cards to each group for different numbers. Instruct them to write two division facts and corresponding two multiplication facts for the given numbers and submit it to teacher. The group who does it correctly in minimum time will be appreciated.

[Experimental Learning]



EXPLAIN

Explain that for each division fact, there are two multiplication facts and vice versa.

Next, discuss how can we do the division sum using multiplication table. For example, to divide 25 by 5, recall the multiplication table of 5 and observe when 25 will occur in table of 5. As 25 occurs at 5 times 5, so, the division statement is $25 \div 5 = 5$.

Further, explain the terms of a division statement as shown alongside.

Where, dividend is the number we divide, here 25 is the dividend.

The number by which we divide is the divisor, here 5 is the divisor.

The number we get as answer is the quotient. Here, second 5 is the quotient.

Next, explain the long division method by writing the statement

$25 \div 5 = 5$ as shown alongside.

Further, explain the division with remainder by considering the real life situation given on pages 122 and 123.

$$\begin{array}{r} 25 \div 5 = 5 \\ \swarrow \quad \downarrow \quad \searrow \\ \text{Dividend} \quad \text{Divisor} \quad \text{Quotient} \end{array}$$

$$\begin{array}{r} 5 \leftarrow \text{Quotient} \\ \text{Divisor} \rightarrow 5 \overline{) 25} \leftarrow \text{Dividend} \\ \underline{- 25} \\ 0 \end{array}$$

ELABORATE

Demonstrate on board by taking the reference and examples given on page 118 that for each multiplication fact, we have two division facts. Like:

After demonstrating the division using the multiplication tables, demonstrate some more examples and make them understand how to do long division with 0 remainder and non-zero remainder. Take the references and examples given on pages 118–123.

$$\begin{array}{c} 9 \times 3 = 27 \\ \swarrow \quad \searrow \\ 27 \div 9 = 3 \quad 27 \div 3 = 9 \end{array}$$

[Conceptual Learning]

EVALUATE

Classwork: Ask the students to do Q.1 (a), (b), (c) and Q.2 (a) to (f) of Practice Time 6D, Q.1 (a), (b) and Q.2 (a) to (d) of Practice Time 6E and Q.1 of Practice Time 6F. If the students make any error while doing the division, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 6D to 6F as homework assignment.



ENHANCE

- Ask to solve ‘Think Tank’ given on page 119. [Critical Thinking]
- Discuss and ask to solve division problems given in ‘Fast Check’ on page 120.

Periods: 11–12

**Topics: Properties of division,
Division stories**

**Suggested extra teaching aids:
Math Genius 2, Pages 123–125**

ENGAGE

Write some multiplication facts based on properties of multiplication on board, like: $5 \times 1 = 5$, and ask the corresponding division fact from the class. Accept the responses. Introduce that as $5 \times 1 = 5$; the corresponding division facts are $5 \div 5 = 1$ and $5 \div 1 = 5$ *i.e.*, when we divide a number by itself we get the quotient 1, similarly when we divide any number by 1, we get the same number as quotient, and so on.

EXPLORE

Use the activity given in ‘Gamified Learning’ section on page 128 to reinforce the concept of division without and with remainder. [Experiential Learning]

EXPLAIN

Discuss that division of ‘0’ by any number will give the quotient ‘0’, and explain that we cannot divide any number by ‘0’.

Write some more real-life problems based on division by 1-digit numbers on the board. Discuss the ways to extract the correct information from the problem written on the board. After that devise a plan for how to solve the problem, then workout the solution and at last check the solution.

ELABORATE

Demonstrate on board the example and few questions of Practice Time 6H given on page 125 of the textbook. [Conceptual Learning]

EVALUATE

Classwork: Ask to solve few questions of Practice Time 6G and 6H. If the students make any error while solving the problems, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 6G and 6H as their homework assignment.

ENHANCE

- Discuss the content of ‘Math Insight’ and motivate the children to remember it.
- Discuss and ask to solve ‘Think Tank’ and ‘Maths Connect’ given on pages 124 and 125, respectively.

Periods: 13–14

**Topic: Revision (Chapter
Assessment)**

**Suggested extra teaching aids:
Math Genius 2, Pages 126–127**

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’, ‘Mental Maths’, and ‘Challenge Question’.



ELABORATE

Discuss questions 1 to 4 of the 'Chapter Assessment' and accept students' answers. If they have any confusion or make any error, then explain and correct them. Discuss 'Challenge Question' and motivate students to solve 'Mental Maths'.

EVALUATE

Classwork: Discuss questions 1 to 4 of the 'Chapter Assessment' in the classroom.

Homework: Ask to solve Q.5 and 6 of 'Chapter Assessment' given on pages 126 and 127 of the textbook.

ENHANCE

- Ask to download worksheets from the internet with the help of friends, teachers and parents and practise them.
- Ask to watch video on division on www.orangewebsupport.co.in.



Fractions

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand about whole and its parts.
- ◆ describe a fraction as a part of a whole when divided into equal parts
- ◆ find half, one-third, one-fourth of a whole and differentiate between them
- ◆ understand fraction as a part of a collection

LESSON PLAN

Suggested number of periods: 8

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some real-life objects like sketch pens, pens, pencils, bowl, etc.

Keywords: Equal parts, Unequal parts, Fraction, Half (Plural; halves), One-third, One-fourth, Quarter, Three-fourths, Collection.

Pre-requisite knowledge: Students must be familiar with multiplication and division.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–4	Topics: Understanding fractions, Half or One-half, One-third, One fourth or Quarter, Three-fourths	Suggested extra teaching aids: Some real-life objects, transparent bowls, some fraction sticky notes, etc. Math Genius 2, Pages 131–134
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ENGAGE

Introduce the topic in the classroom with some interesting activities. For this, talk about the real life situations where we need to use the fraction. For example,

- Aarti’s mother gives her a guava and tells to share it with Swati, her younger sister. Can you say how will she share it?
- Mohit has brought a loaf of bread in the school. He would like to share it with his friends Divakar and Harsha during break. Can you help him in cutting the loaf of bread into equal pieces? How will you cut it?

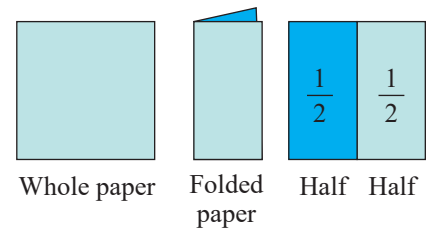
Accept their responses and introduce the term ‘fraction’.

Teacher can discuss the concept given in ‘Get Ready’ section on page 131 of the textbook.

EXPLORE

Introduce: Division of a whole into two halves, three one-thirds and four one-fourths.

Divide the class into pairs. Give them a squared paper sheet. Instruct them to fold the square paper into equal halves, press the crease, and then unfold the sheet. Ask: How many equal divisions are made in the sheet? What does it call? Accept the responses.



Again, instruct them to fold that square sheet into three equal parts and then four equal parts, respectively, and unfold the sheet.

Ask: How many equal divisions were made in the sheet in both cases? What do they call it? Accept the responses.

If children get stuck at any point, the teacher will help.

[Experiential Learning]

EXPLAIN

We can divide a whole object into equal and unequal parts. When a whole object is divided into equal parts, each part is called a **fraction**.

When we divide a whole thing into two equal parts, each part is called half or **one-half** of the whole and write it as $\frac{1}{2}$. Show that two halves make a whole by using a real life object like apple.

When we divide a whole thing into three equal parts, each part is called **one-third** of the whole and write it as $\frac{1}{3}$. Similarly, when we divide a whole thing into four equal parts, then each part is **one-fourth** of the whole.

One-fourth is written as $\frac{1}{4}$. Further when we divide an object into four equal parts, then 3 parts together out of 4 equal parts is called **three-fourths** or three quarters. We write **three-fourths** as $\frac{3}{4}$.

ELABORATE

Divide the board in five columns and give the heading of columns as whole, One-half, One-third, One-fourth and Three-fourths as shown.

Whole	One-half	One-third	One-fourth	Three-fourths

Distribute some fraction sticky (at least 3) notes to each child and ask to paste them in the correct category.

Also, demonstrate the references and examples given on pages 132–134.

[Experiential Learning]

EVALUATE

Classwork: Instruct the class to do Q.1, 2 of Practice Time 7A and 7B in the classwork.

Homework: Ask to solve the rest of the questions of Practice Time 7A and 7B in the homework.

ENHANCE

- Discuss ‘Knowledge Desk’ and ask to solve ‘Think Tank’ given on pages 132 and 134 respectively.

Periods: 5–6

Topic: Fraction as a part of a collection

Suggested extra teaching aids:

Some real life objects

Math Genius 2, Page 135

ENGAGE

First revise the concept of one-half, one-third, one-fourth and three-fourth.

Introduce the topic ‘fraction as a part of a collection’.

EXPLORE

Show 12 pencils or erasers in the classroom. Call a child and ask him/her to distribute the 12 pencils/erasers into two equal groups. Now, ask the number of pencils/erasers he/she gives to each group and instruct to write it on board.



Further, call another child and ask him/her to distribute it into three equal groups and count the number of pencils/erasers given in each group and write it on board. Continue the process with different number of items till time permits. **[Experiential Learning]**

EXPLAIN

Explain that when we distribute 12 pencils into two equal groups, each group gets half $\left(\frac{1}{2}\right)$ of the collection.

So, $\frac{1}{2}$ of 12 = $12 \div 2 = 6$.

When we distribute 12 pencils into three equal groups, each group gets one-third $\left(\frac{1}{3}\right)$ of the collection.

So, $\frac{1}{3}$ of 12 = $12 \div 3 = 4$.

When we distribute 12 pencils into four equal groups, each group gets one-fourth $\left(\frac{1}{4}\right)$ of the collection.

So, $\frac{1}{4}$ of 12 = $12 \div 4 = 3$, and so on.

[Conceptual Learning]

ELABORATE

Demonstrate on board some real-life examples by taking the reference given on page 135 of the textbook.

EVALUATE

Classwork: Discuss ‘Fast Check’ given on page 135 in the classwork. If the students make any error, the teacher will correct it and explain.

Homework: Ask to do the ‘Activity’ given on page 135 as homework assignment.

ENHANCE

- Discuss and ask to find the answers of question asked in ‘Challenge Question’ given on page 136.

[Critical Thinking]

Periods: 7–8

Topic: Revision (Chapter Assessment)

Suggested extra teaching aids: Math Genius 2, Pages 136–137

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision exercise.

EXPLORE

Guide the students to do the activity given in ‘Gamified Learning’ section on page 137.

[Experiential and Collaborative Learning]

EXPLAIN

Start the revision exercise by using ‘Chapter Assessment’.

ELABORATE

Discuss Q.1 and 2 of the ‘Chapter Assessment’, and accept students’ answers. If they have any confusion or they make any error, then explain and correct them.

EVALUATE

Classwork: Ask to do Q.1 and 2 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to do Q.3 and 4 of ‘Chapter Assessment’ as homework assignment.

ENHANCE

- Ask to watch video on fraction for grade 2 on www.orangewebsupport.co.in.

[Net Connect]





Shapes and Patterns

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand about the formation of shadows
- ◆ visualise plane or 2D shapes in the shadow of a solid or a 3D shape
- ◆ explore more about plane shapes
- ◆ identify different types of lines
- ◆ draw a straight line using a ruler
- ◆ understand the characteristics of solid or 3D shapes
- ◆ identify the nature of surface of a solid shape
- ◆ identify patterns and see different patterns in the surroundings

LESSON PLAN

Suggested number of periods: 13

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some real-life objects, torch, etc.

Keywords: Shadow, Vertex (Plural; vertices), Side, Edge, Plane shapes, Solid shapes, Rectangle, Triangle, Circle, Oval, Square, Straight lines, Curved lines, Cube, Cuboid, Cylinder, Cone, Sphere, Faces, Roll, Slide, etc.

Pre-requisite knowledge: Students must be familiar with plane shapes like: Rectangle, square, triangle, circle, and solid shapes like: Cube, cuboid, cylinder, cone and sphere.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Period: 1

Topic: Fun with shadows

Suggested extra teaching aids: Some real-life objects, torch, etc. Math Genius 2, Pages 138–139

ENGAGE

After greeting the students, ask few questions like:

- Have you seen your own shadow or the shadow of a tree, a dog, a cow or any other animal?
- Do you know how a shadow is formed?
- When do we see a shadow?
- When does a shadow vanish?

Accept the responses. Introduce the topic 'Fun with shadows'. Discuss the content of 'Get Ready' section.

EXPLORE

Divide the class into groups (2–4 students per group).

Make the classroom darker and provide each group a torch and a set of small objects.

Instruct them to create different types of shadows using the torch and small objects. Encourage them to experiment with the distance between the object and the wall and the torch and the size and shape of the object. Once they have created a variety of shadows, discuss about their shadow observation.

[Cross-curricular Learning]

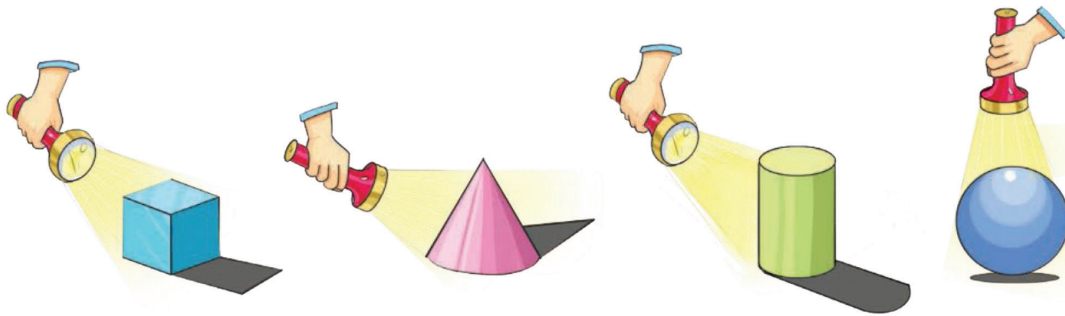
EXPLAIN

Introduce that when an object blocks a source of light, like bulb or torch or sunlight, etc., it creates a shadow.

Say: You can see the image and how the shadow of the man's hands can be seen on the wall because his hands are blocking the source of light.

ELABORATE

Demonstrate the following shadow formation in the classroom, that the shadow of a cube forms a square, a cone forms a triangle, a cylinder forms a rectangle and a sphere forms a circle.



Also discuss the correct identification of shadow formation with their names given on page 139 of the textbook.

[Experiential Learning]

EVALUATE

Classwork: Based on the topics covered in particular period discuss Q.1 and 2 of Practice Time 8A.

Homework: Ask to solve the following questions as homework assignment.

Tick (✓) the shape of the shadow formed by an object when the source of light is kept on its one side.

1. The shadow of a rubik's cube formed is in the shape of a
(a) circle (b) square (c) triangle
2. The shadow of a birthday cap formed is in the shape of a
(a) circle (b) rectangle (c) triangle
3. The shadow formed by a ball is in the shape of a
(a) circle (b) rectangle (c) triangle

ENHANCE

- Discuss and ask to solve 'Think Tank' given on page 139.
- Ask to write 5 lines on 'Togalu Gombeyaata' the puppetry art form practised in Karnataka, from the internet with help of teacher and parents.

ENGAGE

After the greeting, start the class by engaging the children in an activity. Ask the class to trace the outline of base of the objects available with them. For example, eraser, chalk box, duster, sharpener, pencil box, book, bangle, etc. Instruct them to observe the drawn shape. Introduce the plane shapes.

EXPLORE

Divide the students into groups and give each group a list of different-shaped items (triangle, rectangle, square, circle) to find around in the classroom and school. The teacher can use clues to point them to the right item. For example, students can find something round that ticks or something rectangular with pages. Groups can write where they find each item or if possible, bring the item along. The group who finds maximum number of shapes with correct classification will be appreciated. **[Experimental and Collaborative Learning]**

EXPLAIN

Triangle, rectangle, square, circle and oval are plane shapes. A plane shape can have sides and corners. A corner of a plane figure is called its vertex. The plural of vertex is vertices. The straight lines forming a plane figure are called its sides. Further, explain the lines: Straight and curved, the types of straight lines by taking the reference and example given on pages 141 and 142.

ELABORATE

Ask the class to observe the board and identify its shape. Demonstrate its vertex and side, ask to observe the number of its vertices and sides and the relationship between the sides. Next, draw a square on board explain about its sides and vertices. Show that the number of vertices and sides in rectangle are same only the difference is that the opposite sides of a rectangle are equal, where all the sides of a square are equal. Further, demonstrate the triangle, circle and oval on board with its properties on sides and vertices. Teacher will take the reference from the page 140 of the textbook.

Next demonstrate the straight and curved lines by using the thread. Hence, discuss about the three types of straight lines: Horizontal line, vertical line and slanting line. The teacher can use ruler to explain this.

Further demonstrate drawing a straight line by taking the reference from the page 143 of the textbook.

[Conceptual Learning]

EVALUATE

Classwork: Ask the students to do Q.3 and 4 of Practice Time 8A, and Q.1 and 2 of Practice Time 8B in the classwork. If the students make any error, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 8A and 8B as homework assignment.

ENHANCE

- Discuss ‘Maths Connect’ given on page 142 of the textbook.



ENGAGE

Start the class with an interaction. Show any object such as a duster or a dice to the class, ask about its shape. Also, teacher can ask number of its sides and vertices. Accept the responses. Let them know what the faces, edges and vertices of solid shapes are.

EXPLORE

Use the activity given on page 145 of the textbook to reinforce the concept of different solid shapes.

[Experiential Learning]

EXPLAIN

Recall the shape of cube, cuboid, cylinder and cone. Demonstrate that a cube has 6 faces, 12 edges and 8 vertices. Explain that all the edges of a cube are of the same length, and all its faces are of same size *i.e.*, square. Similarly, a cuboid has 6 faces, 8 vertices and 12 edges. But only its opposite faces are equal. Further, demonstrate that a cylinder has 3 faces (1 curved and 2 plane) and 2 edges. Its opposite faces are equal. Next, demonstrate a cone and a sphere and tell that a cone has also two faces one plane and other curved, 1 vertex and 1 edge while a sphere has only a curved face, but it does not have any edge or vertex.

Further, discuss about nature of surface, *i.e.*, flat or curved face. Explain that a solid can stack, roll or slide depending upon its surfaces.

ELABORATE

Collect some objects having different shapes and size. Demonstrate the stacking, rolling and sliding of an object and discuss the reason behind it by taking the references given on page 146 of the textbook.

[Conceptual Learning]

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 8C and 8D. If the students make any error while solving the problems, the teacher will correct it and explain.

Homework: Ask to solve Q.2 of Practice Time 8C and 8D as their homework assignment.

ENHANCE

- Discuss and ask to solve ‘Think Tank’ given on page 145 of the textbook.
- Ask to do the ‘Project’ given on page 147.

ENGAGE

Start the class by showing some real-life objects like a sunflower, or design of a window and ask what they observe. Accept the responses. Introduce the topic ‘Patterns’.

EXPLORE

Divide the class into pairs. Give them some cut-outs of different shapes. Instruct them to make their own pattern using those cut-outs.



Ask from a student other than the pair to identify and tell the name of the next two cut-outs of the shapes to continue the pattern. Accept the responses.

Continue with other pairs and different cut-outs of shapes, numbers or letters.

EXPLAIN

A sequence of figures, shapes, letters or numbers that repeat itself is called a pattern.

We can find beautiful patterns on sarees, carpets, *rangolis*, tiles, and in nature. Explain about pattern in shapes, pattern in numbers and pattern in letters.

ELABORATE

Demonstrate on board when three different shapes, colors, etc. are repeated over and over again, it is known as **ABC pattern**.

And the patterns in which one or more elements of the sequence or arrangement increases then it is known as **increasing pattern**. Increasing patterns should be both numerical and non-numerical.

Further, demonstrate the analogical pattern, pattern in numbers and letters by taking the references given on pages 147 and 148 of the textbook.

EVALUATE

Classwork: Discuss and ask to do Q.1 and 2 of Practice Time 8E. If students make any error, the teacher will correct it and explain.

Homework: Ask to solve Q.3 of Practice Time 8E as homework assignment.

ENHANCE

- Discuss and ask to do the activity given in ‘Maths Fun’ on page 148.

[Creative Thinking and Art Integration]

Periods: 12–13

Topic: Revision (Chapter Assessment)

Suggested extra teaching aids: Some real life objects, some cut-outs of different shapes, etc. Math Genius 2, Pages 150–151

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Guide the students to do the activity given in ‘Gamified Learning’ section on page 151 in the classroom.

EXPLAIN

Start the revision of the exercise by using ‘Mental Maths’, ‘Chapter Assessment’ and ‘Challenge Question’.

ELABORATE

Discuss ‘Mental Maths’ and Q.1, 2, 3 of the Chapter Assessment and accept students’ answers. If they have any confusion or they make any error, then explain and correct them.

EVALUATE

Classwork: Ask to solve Mental Maths and Q.1, 2, 3 of the Chapter Assessment.

Homework: Ask to solve Q.4 and 5 of Chapter Assessment.

ENHANCE

- Ask to watch video on shapes and patterns on ‘www.orangewebsupport.co.in’.
- Ask to solve the ‘Challenge Question’ given on page 151.





Measurement

Learning Objectives

After studying this chapter, students will be able to...

- ◆ explore the length, mass and capacity of objects available in the surrounding.
- ◆ understand measuring lengths using non-standard units such as body parts and other objects.
- ◆ understand about the standard units of length.
- ◆ addition and subtraction of length given in cm or m.
- ◆ understand about the standard units of weight.
- ◆ addition and subtraction of weight given in g or kg.
- ◆ understand about the standard units of capacity.
- ◆ addition and subtraction of capacity given in mL or L.
- ◆ apply the skills in handling real life problems based on measurements.

LESSON PLAN

Suggested number of periods: 14

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some slips of paper on which different measurements are written, bowl, ruler, some weights, some container of different capacity, etc.

Keywords: Measurement, Length, Width, Height, Weight, Mass, Capacity, Volume, Units (standard and non-standard), Metre, Centimetre, Millimeter, Gram, Kilogram, Litre, Millilitre.

Pre-requisite knowledge: Students must be familiar with units of measurement, addition and subtraction of numbers.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–4

Topics: Measurement of length,
Addition and subtraction of
lengths

Suggested extra teaching aids: Some real-life
objects, Measuring tools, etc.
Math Genius 2, Pages 152–158

ENGAGE

After the greeting, instruct each student to measure the length of their desk, with handspan and with a ruler or a thread. Ask the measure. Accept the responses. Discuss why the measure of each is different in handspan and same in ruler or thread. Also discuss the story given in ‘Get Ready’ and answer the questions.

EXPLORE

Divide the class into pairs. Give 2 pencils to each pair. Instruct to measure their lengths by using a ruler separately and then measure the combined length of both the pencils, and note them.

Ask: What is the length of each pencil? What is the combined length of both pencils? Accept the responses.

Next, give them a paper strip. Instruct to measure its length and then cut a piece from it and measure again.

Ask: What is the difference in the length of the strip in both cases? Accept the responses. Demonstrate the addition and subtraction of length on the blackboard to the class. **[Experimental Learning]**

EXPLAIN

Lengths can be measured by using non-standard units of measurement of length: handspan, finger width, cubit, pace and footspan. But these are varying person to person. So, for accurate measurement, we use standard units of measurement of length, centimetres and metres. We write centimetre as **cm** and metre as **m**. Centimetre (cm) is used to measure the length of smaller objects, like the length of a pencil, width of desk, book. To measure shorter length, we use ruler. Further, explain the method of measuring length using a ruler.

Next, discuss that to measure bigger length like length/height of wardrobe, a person, we use the unit **metre (m)**.

Further, explain that to add two or more lengths in metres or centimetres, we simply add the numbers and write down the unit with the sum obtained.

Similarly, to subtract the given lengths, we simply subtract the smaller length (number) from the bigger length (number) and write down the unit with the difference obtained.

ELABORATE

Demonstrate measuring the length of an object like pencil, or a book by using ruler *i.e.*, in centimetre (cm) and the objects like side of a wardrobe or door in metre (m) by taking the reference given on pages 154–155 of the textbook. **[Experiential Learning]**

EVALUATE

Classwork: Ask to solve Q.1 and 2 of Practice Time 9A and Q.1 (a), (b) and 3 of Practice Time 9B. If any student makes any error, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 9B as their homework assignment.

ENHANCE

- Ask to do the activity in ‘Fast Check’ given on page 154, ‘Think Tank’ given on page 155 and ‘Maths Fun’ given on page 156. **[Holistic Learning]**
- Ask to watch the video on measurement on the link “www.orangewebsupport.co.in”. **[Tech Connect]**

Periods: 5–8

Topics: Measurement of weight (mass), Addition and subtraction of weights

Suggested extra teaching aids: Some real life objects, weighing scale and some weights of 50 g, 100 g, 250 g, 500 g, etc. Math Genius 2, Pages 158–163

ENGAGE

Put a few things like duster, pen, pencil, 1 banana, 1 orange, etc. on teacher’s table. Call students one by one and ask to sort out the lightest and the heaviest among those. Arrange all the things in the increasing order of their weight.

Ask: How do you know which is light and which is heavy? Which objects have their weight in kg and g? Accept the responses.

EXPLORE

Divide the class into groups. Arrange the weighing machine and a few weights (50 g, 100 g, 250 g, ..., etc.) for them and give them some objects (marbles, pebbles, notebooks, pencil box, lunch box, etc.). Instruct to measure the weights of the given objects. Ask to record which object is lighter and which object is heavier. Accept the responses and discuss standard units of weight. **[Experimental Learning]**

EXPLAIN

Weights can be measured by using non-standard units of measurement of weight like cup, tablespoon, teaspoon, pinch, bowl, glass, etc. But the size of these may vary. So, for accurate measurement of weight, we use standard units of measurement of weight *i.e.*, gram and kilogram.

We write gram as **g** and kilogram as **kg**. Gram (g) is used to measure the weight of lighter objects, like the weight of a pencil, orange, soap, etc. And to measure heavier objects like weight of bags of vegetables, fruits, a person, we use kilogram (kg).

Further, explain that to add two or more weights in grams or kilograms, we simply add the numbers and write down the unit with the sum obtained.

Similarly, to subtract the given weights, we simply subtract the smaller weight (number) from the bigger weight (number) and write down the unit with the difference obtained.

ELABORATE

Demonstrate in the classroom on the weighing scale, that when we put 1000 g (100 g + 200 g + 200 g + 500 g) together, we get 1 kilogram. So, $1000 \text{ g} = 1 \text{ kg}$.

Further, demonstrate the addition and subtraction of weights on board by taking the reference of examples given on page 162. **[Conceptual Learning]**

EVALUATE

Classwork: Ask to solve Q.1 and Q.2 of Practice Time 9C and Q.1 (a), (b) and Q.2 of Practice Time 9D. If students make any error, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 9C and 9D as homework assignment.

ENHANCE

- Encourage the students to do the Project work given on Page 160. **[Art Integration]**
- Ask to do 'Think Tank' and 'Life Skills' given on pages 160 and 161, respectively.

[Logical Thinking]

Periods: 9–12

Topics: Measurement of capacity, Addition and subtraction of capacities

Suggested extra teaching aids: Some containers of different measurements, some liquids for measurement. Math Genius 2, Pages 163–167

ENGAGE

Put three bottles of different sizes on the table. Call one student to fill them with water. Ask from class, which of the bottles has maximum water and which has minimum water. Accept the responses. Further, ask which can store more water, a bottle or a bucket? Accept the responses. Introduce 'measurement of capacity'.

EXPLORE

Arrange some containers on various sizes like four 100 mL bottles, two 250 mL bottles, four 500 mL bowls, two 1000 mL mugs, one 2 L bottle, one 5 L can without marking (for capacity) on teacher's table. Call students one by one and ask them to

- arrange containers in ascending /descending order by estimating its capacity.
- select containers whose capacity is equal to 2 L.
- select containers whose capacity is equal to 5 L, and so on.

If students have any confusion, teacher will help them.

[Experiential Learning]

EXPLAIN

The quantity of a liquid that a container or vessel can hold is called its capacity. Cup, glass, spoon, etc. are non-standard units of measurement of capacity. So, for accurate measurement of capacity, we use standard units of measurement of capacity, litres and millilitres.

To measure small quantities of any liquid, we use millilitres (mL), and to measure large quantities of any liquid, we use litres (L).




Further, explain that to add the capacity of two or more containers in litres and millilitres, we simply add the numbers and write down the unit with the sum obtained.

Similarly, to subtract the capacity of two containers, we simply subtract the smaller capacity (number) from the bigger capacity (number) and write down the unit with the difference obtained.

ELABORATE

Vessels of different sizes are used to measure different quantities of liquid. To measure the capacity of a small quantity of liquid mL is used, while 'litre' is used to measure the capacity of a large amount of liquid. There are 1000 mL in 1 L, *i.e.*, 1 L = 1000 mL.

Demonstrate with the help of book page 164, that small quantities of liquids are measured in millilitre. It is denoted by 'mL'. Like:

		
200 mL	5 mL	150 mL

Large quantities of liquids are measured in litres. It is denoted by 'L'. Like:

		
20 L	150 L	225 L

Further, demonstrate addition and subtraction of capacities on board by taking the reference of examples given on page 166.

EVALUATE

Classwork: Instruct to solve Q.1 and 2 of Practice Time 9E and Q.1 (a) and (b) and Q.2 of Practice Time 9F in the classroom.

Homework: Ask to solve the remaining questions of Practice Time 9E and 9F as homework assignment.

ENHANCE

- Ask students to perform the ‘Activity’ given on page 164 and do the question of ‘Fast Check’ given on page 165.
- Discuss and do the question of ‘Math Connect’ given on page 167.

Periods: 13–14

Topic: Revision (Chapter Assessment)

Suggested extra teaching aids: Math Genius 2, Pages 168–169

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Guide the students to perform the activity given in ‘Gamified Learning’ on page 169.

[Experiential Learning]

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’, ‘Challenge Question’ and ‘Mental Maths’ of the chapter.

ELABORATE

Discuss ‘Mental Maths’, ‘Challenge Question’, Q1 to 3 of the ‘Chapter Assessment’ in the classroom, and accept students’ answers. If they have any confusion or they make any error, then explain and correct them.

EVALUATE

Classwork: Discuss questions 1 to 3 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to solve Q4 and 5 of the ‘Chapter Assessment’ given on page 168 as homework assignment.

ENHANCE

- Ask to solve worksheets on the measurement given on the “www.orangewebsupport.co.in”.

[Tech Connect]



Time and Calendar

Learning Objectives

After studying this chapter, students will be able to...

- ◆ read time on a clock in complete hour, half past hour and quarter of the hour.
- ◆ know the order of the days of a week and the months of a year.
- ◆ explore the calendar.
- ◆ understand about the cycle of seasons
- ◆ understand the directions—east, west, north and south.

LESSON PLAN

Suggested number of periods: 14

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, wall clock/table clock, calendar, charts on seasons, etc.

Keywords: Clock, Dial, Hour hand, Minute hand, Ante meridiem (A.M.), Post meridiem (P.M.), Minutes, seconds, Quarter past, Quarter to, Leap year, East, West, North, South, Season, Spring, Winter, Summer, Autumn.

Pre-requisite knowledge: Students must be familiar with time of a day—morning, noon, evening and night; clock—minute hand, hour hand, reading time when minute hand is at 12; days of a week, months of a year and main season of a year, etc.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–5

Topic: Clock

Suggested extra teaching aids: Wall clock or table clock. Math Genius 2 Pages 170–175

ENGAGE

Start the class with an interaction by asking about some activities those are done in different time of a day. For example, walking, working, cooking, playing, studying, sleeping, etc. Further, ask some questions like: At what time do you wake up? At what time do you come to school? At what time do you leave the school? At what time do you sleep? Accept the responses.

Discuss the concepts given in “Get Ready” section on page 170.

EXPLORE

Divide the class into two groups A and B. Give a cardboard clock with the minute and the hour hands to them. Instruct group A to display the time in hours and the group B will read the time. If group B identifies the time



shown on the clock correctly, then group B will get 1 point. In the similar way, there will be five rounds for each group. Group who will identify more correct time will win the game. **[Experimental Learning]**

EXPLAIN

A clock has two hands; one is shorter than the other. The shorter hand is the hour hand and the longer hand is the minute hand. These hands move in a clockwise direction. The dial of the clock is divided into 12 big divisions, numbered from 1 to 12. There are 60 small divisions on the whole dial. The minute hand (longer hand) moves from one small division to the next small division in 1 minute. It goes once around the dial in 1 hour. So, the minute hand covers 60 small divisions in 1 hour.

So, 1 hour = 60 minutes.

The hour hand moves from one number to the next number in 1 hour.

So, it takes 12 hours to complete one round. The hour hand takes 2 complete rounds in a day.

So, 1 day = 24 hours.

To differentiate the timing of morning and evening we use a.m. (Ante-meridiem) and p.m. (Post-meridiem).

The time is in full hours when the minute hand is at twelve. The time is half an hour when it is on 6, quarter past the hour when it is on 3, and quarter to the hour when it is on 9.

The minute hand moves from one number to the next number in 5 minutes.

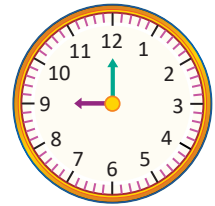
Any time can be read and written using 'past the hour' as well as 'to the next hour'.

- When the minute hand is in the left half, the time is read as to.
- When the minute hand is in the right half, the time is read as past.

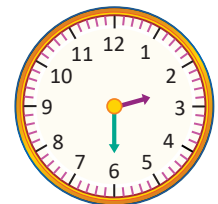
ELABORATE

Demonstrate that the hour hand is on 9 and the minute hand is on 12.

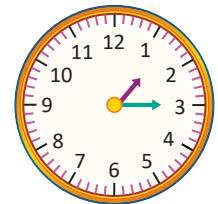
So, the time is 9:00 or 9 o'clock. If it is in morning, we write it as 9 a.m.; and if it is in night, we write it as 9 p.m.



Again, demonstrate half past hour on the clock. As in the given clock, the hour hand is between 2 and 3 and the minute hand is on 6. So, the time is 2:30 or half past 2.



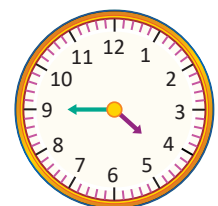
Similarly, demonstrate the time in quarter past and quarter to in the clock. As, the minute hand in the clock is at 3. It shows 15 minutes, as $3 \times 5 = 15$. The hour hand is slightly past 1. The time shown by the clock is 'quarter past one' or 1:15.



Again, show a quarter to an hour. As in the given clock, the hour hand is near 5, and the minute hand is on 9.

So, the time is 4:45 or quarter to 5.

The teacher can also take the references and examples given on pages 171 to 174.



[Experiential Learning]

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 10A, Q.2 of Practice Time 10B and Q.1, 2 of Practice Time 10C. If any student makes any error, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 10A and 10B as their homework assignment.

ENHANCE

- Discuss ‘Think Tank’ given on page 173. [Logical Thinking]
- Ask to watch the video on ‘Time’ on the link “www.orangewebsupport.co.in”. [Tech Connect]

Periods: 6–9

Topics: Days of a week, Today, yesterday and tomorrow, Calendar

Suggested extra teaching aids: Calendar of current year, etc. Math Genius 2, Pages 175–179

ENGAGE

Ask from students what day is today? What day was yesterday? At what day of a week, the school is closed? Tell the name of the days of the week. Accept the responses. Teacher can also discuss the story given on page 175.

EXPLORE

Hang a calendar on the board.

Instruct students to come one by one and mark their birthday on calendar.

Ask from the other students of the class to identify month and day of birthday? Accept the responses.

[Experimental Learning]

EXPLAIN

Monday is the 1st day, Tuesday is the 2nd day, and in the same way, Sunday is the 7th day of the week. For present day we use the word ‘Today’, and yesterday for the day before present day and tomorrow for the day after the present day.

A calendar is a chart, which shows days, dates, weeks and months in a year. One year has twelve months and 365 days. January is the first month and December is the last month. There are 7 months which have 31 days each and 4 months which have 30 days each. February is the shortest month of the year with 28 days. Once in 4 years, February has 29 days. Such a year is known as a leap year.

[Conceptual Learning]

ELABORATE

Demonstrate on board the references and examples in detail as given on pages 175 to 179 of textbook.

[Conceptual Learning]

EVALUATE

Classwork: Ask to solve Q.1, 2 of Practice Time 10D, Q.3 of Practice Time 10E and Q.2 of Practice Time 10F. If any student makes any error, the teacher will correct it and explain.

Homework: Ask to solve the remaining questions of Practice Time 10D, 10E and 10F as their homework assignment.



ENHANCE

- Discuss ‘Think Tank’s given on pages 176 and 178.
- Ask to do the project given in ‘Maths Fun’ on page 176.
- Discuss ‘Fast Check’ given on page 178 of textbook.

[Logical Thinking]

[Cross Curricular Learning]

Periods: 10–12

Topics: Seasons, Directions

**Suggested extra teaching aids: A chart having cut-out/images of some seasons, some seasonal objects, etc.
Math Genius 2, Pages 180–182**

ENGAGE

After the greeting, start the class by asking few questions like:

- Which season is going on?
- In which season do we feel cold? What would you like to wear in this season?
- In which season do we feel hot? What would you like to eat or drink in this season?

Accept the responses. Start the topic ‘Season’.

EXPLORE

Divide the class into groups. Put a variety of seasonal objects and pictures that show the five different seasons on the teacher’s table.

Write the word ‘summer’ on the board, call one group in front of class and instruct to write some words describing the season and select the objects and pictures related to the season with the help of each other.

Do the same for ‘winter’, and the other seasons with other groups. The group that writes more words and finds more objects and pictures related to the season will be appreciated.

[Holistic Learning]

EXPLAIN

Tell the class that in our country, there are five seasons in a year, winter, spring, summer, rainy or monsoon and autumn. As winter is cold, spring is pleasant (neither hot nor cold), summer is hot, it rains in the rainy season and we observe leaves fall on the ground in autumn season.

Further, explain that if you are standing facing the rising sun which is in the east, the direction towards the right is south, the left is north and behind you is west.

Take the references and examples given on pages 180 to 182 of the textbook.

[Conceptual Learning]

ELABORATE

Ask students to read the rhyme given on page 182 of the textbook in chorus, and ask some students to act on it in front of the class. Use this rhyme to demonstrate the concept of directions to the class.

[Experiential Learning]

EVALUATE

Classwork: Ask to solve Q.1 and 3 of Practice Time 10G and 10H in the classroom. If any student makes any error, the teacher will correct and explain.

Homework: Ask to solve Q.2, 4 of Practice Time 10G and 10H as homework assignment.

ENHANCE

- Ask to write a poem on season/direction on a colourful chart paper with the help of friends, parents and teachers.

[Holistic Learning]



ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Guide the students to do the activity as suggested in ‘Gamified Learning’ section on page 184 of the textbook.

[Cross Curricular Learning]

EXPLAIN

Start the revision of the exercise by using ‘Mental Maths’, ‘Chapter Assessment’, and ‘Challenge Question’ of the chapter.

ELABORATE

Discuss questions 1 to 4 in the ‘Chapter Assessment’ and accept students’ answer. If they have any confusion or they make any error, then explain and correct them. Discuss and motivate students to solve ‘Mental Maths’, and guide them to do the ‘Activity’ given on page 179 of the textbook.

EVALUATE

Classwork: Discuss questions 1 to 4 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to solve Q.5 to 7 of ‘Chapter Assessment’ as homework assignment.

ENHANCE

- Ask to watch the video on ‘Time’ for grade 2 on “www.orangewebsupport.co.in”.





Money

Learning Objectives

After studying this chapter, students will be able to...

- ◆ understand the use of money
- ◆ count money of different denominations
- ◆ exchange notes or coins for a note or coin of a bigger value
- ◆ understand the combination of notes and coins to make a certain amount
- ◆ add and subtract money and apply the concept in shopping

LESSON PLAN

Suggested number of periods: 12

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, some dummy notes and coins of different denominations.

Keywords: Currency, Notes, Coins, Rupees, Paise, Addition, Subtraction, Total amount, Balance.

Pre-requisite knowledge: Students must be familiar with what currencies are used for, Indian currencies and its symbol, coins and notes in use, counting of money, addition and subtraction of numbers, etc.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–5

Topics: Money, Counting Money, Change of Money

Suggested extra teaching aids: Some dummy notes and coins of different denominations, Math Genius 2, Pages 185–188

ENGAGE

Show currency notes and coins of different denominations in the classroom. Instruct to identify them and tell their values. Accept the responses. Discuss the concepts given in ‘Get Ready’ section on pages 185 and 186. Guide them to solve the questions given in it.

EXPLORE

Divide the class into groups. Give them some dummy currency notes. Arrange some of the objects on the table with a price tag on each. Keep prices under ₹100. Instruct the group to act as a buyer and buy things using dummy currency. Repeat with all students. Observe them and help them if any group wants it.

[Experimental Learning]

EXPLAIN

We use money to buy things and pay for services. Indian currencies are available in the form of notes and coins. The symbol '₹' is used for rupees and 'p' for paise. 100 paise is equal to ₹1.

Further, explain the topic 'Counting of Money'. To count money, we start from biggest amount.

Further, explain how to change a note or coin of greater value with many notes or coins of a smaller value.

ELABORATE

Demonstrate in class the different Indian coins and notes either by dummy currencies or taking references of images given on page 186 of the textbook.

Demonstrate some notes and coins and ask for the total amount one by one.

Also demonstrate the change of money like:



Take the references given on pages 186 to 188 for detailed explanation.

[Conceptual Learning]

EVALUATE

Classwork: Ask to solve few questions of Practice Time 11A and 11B in the classwork.

Homework: Ask to solve the remaining questions of Practice Time 11A and 11B as their homework assignment.

ENHANCE

- Discuss 'Think Tank' given on page 187 of the textbook.

[Critical Thinking]

- Ask to do the activity given in 'Maths Fun' on page 188 of textbook.

[Logical Thinking]

Periods: 6–10

Topic: Addition and
Subtraction of Money

Suggested extra teaching aids: Some dummy
currency notes and some coins.
Math Genius 2, Pages 189–191

ENGAGE

Show two toys or any two objects in the class with price tag under ₹100. Ask: If you want to buy any two of them, how much amount you must have? Accept the responses.

Introduce 'Addition and subtraction of money'.

EXPLORE

Divide the class into groups. Take some objects and put price tags on them. Give dummy currency to them. Choose any group and instruct to play the game of shopping. Ask to buy more than 1 thing and pay the total amount of money to the shopkeeper (the teacher can play the role of shopkeeper).

Further, ask what amount will left if you bought items worth ₹ 75 and you give a ₹ 100 note to the shopkeeper? Accept the response.

[Experimental Learning]

EXPLAIN

Addition and subtraction of money are carried out as usual addition and subtraction of numbers.

ELABORATE

Demonstrate on board examples based on ‘addition and subtraction of money’ by taking references given on pages 189 and 190. Discuss how to solve the story problems given on page 191. **[Conceptual Learning]**

EVALUATE

Classwork: Ask to solve Q.1 and 3 (a), (d) of Practice Time 11C in the classroom. If students make any error, teacher will correct them and explain.

Homework: Ask to solve remaining questions of Practice Time 11C as homework assignment.

ENHANCE

- Discuss and motivate to solve the questions of ‘Maths Connect’ given on page 190 of the textbook.

Periods: 11–12	Topic: Revision (Chapter Assessment)	Suggested extra teaching aids: Math Genius 2, Pages 192–193
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ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Ask and guide students to do activity given under ‘Gamified Learning’ on page 193.

[Experiential and Collaborative Learning]

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’, ‘Mental Maths’ and ‘Challenge Question’.

ELABORATE

Ask to solve questions 1 and 2 of the ‘Chapter Assessment’ and accept students’ answers. If they have any confusion or they make any error, then explain and correct them. Discuss and motivate students to solve Mental Maths. Guide them to solve ‘Challenge Question’ given on page 192.

EVALUATE

Classwork: Ask to solve Q.1 and 2 of the ‘Chapter Assessment’ in the classroom.

Homework: Ask to solve Q.3 and 4 of ‘Chapter Assessment’ and ‘Mental Maths’ as homework assignment.



Data Handling

Learning Objectives

After studying this chapter, students will be able to...

- ◆ sort the things using one or two attributes.
- ◆ understand how to make a list of the required items.
- ◆ represent the information in tables and charts.
- ◆ read the information from the given table and charts.

LESSON PLAN

Suggested number of periods: 10

Suggested Teaching Aids: Book: Math Genius 2, blackboard or whiteboard, etc.

Keywords: Data, Information, Collection, Sorting, Listing, Organising.

Pre-requisite knowledge: Students must be familiar with sorting things, data and its collection and representation.

NEP feature: The way of teaching provides experiential learning opportunities to the students and allows them to work with the support of each other which helps in their holistic development.

Periods: 1–4

Topic: Sorting

Suggested extra teaching aids: Some colour pencils or crayons, etc.
Math Genius 2, Pages 194–197

ENGAGE

Discuss the concept given in ‘Get Ready’ section and instruct to write the answers of the given questions.

EXPLORE

Divide the class into groups. Give them a box having crayons/pencils of mixed colours. Instruct to separate red, yellow, blue, and green coloured crayons/pencils and make table for this.

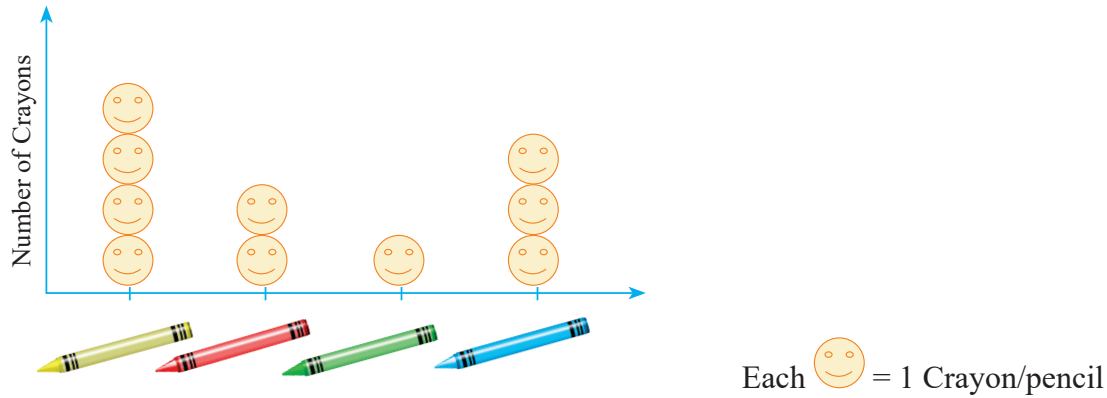
Ask: How many total blue crayons/pencils are there? How many greens crayons/pencils are there? Which colour of crayons/pencils is the maximum in number? Which colour of crayons/pencils is the minimum in number? How many crayons/pencils are there in total? Accept the responses. **[Experimental Learning]**

EXPLAIN

Collection of information in the form of numbers, words, people or things is called data. Data can be displayed through a table or chart.



Organising the data means presenting it in such a manner so that it becomes meaningful at a glance. For example, we can represent the sorting of crayons/pencils in the chart also as shown here.



ELABORATE

Demonstrate the topic ‘sorting’ by taking the reference and example given on pages 195 and 196 of the textbook and ask to complete the chart given on page 195. Discuss and help in writing the answers of given questions by observing the chart. **[Experiential Learning]**

EVALUATE

Classwork: Ask to solve Q.1 of Practice Time 12A in their classwork. If any student makes any error, the teacher will correct him/her and explain.

Homework: Ask to solve Q.2 of Practice Time 12A as homework assignment.

ENHANCE

- Ask to do the given activity and fill the data given in ‘Maths Fun’ on page 197.

Periods: 5–8

Topic: Listing Things

**Suggested extra teaching aids:
Math Genius 2, Pages 198–199**

ENGAGE

After the greeting, ask some general questions from the class like:

- When you are arranging your school bag, name the items you put in your bag.

Accept the responses. Introduce the topic ‘Listing Things’.

EXPLORE

Distribute A4 sheet to the class. Teacher will write some options on board as follows and ask the class to make a list on any of the following:

- Name of friends you want to invite
- Party games
- Party foods
- Gift items, etc.

Instruct the class to prepare a list for the celebration of their birthday party as per their choice.

[Experimental Learning]

EXPLAIN

A list helps us to organise information about important things. For any occasion and activity, we will prepare a list in advance.

ELABORATE

Demonstrate examples of ‘Listing Things’ by taking the reference given on page 198. Then ask the class to make a list for ‘Project’ given on page 198 of the textbook. **[Conceptual Learning]**

EVALUATE

Classwork: Discuss Q.2 of Practice Time 12B in their classwork notebook. If students make any error, teacher will correct it and explain.

Homework: Ask to solve Q.1 of Practice Time 12B as homework assignment.

ENHANCE

- Ask to observe the situation given in ‘Mental Maths’ and answer the given questions

[Critical Thinking]

Periods: 9–10

Topic: Revision (Chapter Assessment)

Suggested extra teaching aids: Math Genius 2, Pages 200–201

ENGAGE

Make students comfortable, so they can ask any question on any previously taught topics in which they are confused. Clarify their doubts or queries and start the revision of the exercise.

EXPLORE

Guide the students to do the activity given in ‘Gamified Learning’ section in the classroom.

[Experiential Learning]

EXPLAIN

Start the revision of the exercise by using ‘Chapter Assessment’ and ‘Maths Connect’.

ELABORATE

Discuss and help to solve the questions given in ‘Chapter Assessment’.

EVALUATE

Classwork: Discuss the questions given in ‘Chapter Assessment’.

Homework: Ask to solve the questions of ‘Challenge Question’ given on page 200 of the textbook.

ENHANCE

- Discuss and motivate to answer ‘Maths Connect’ given on page 200. **[Cross curricular Learning]**
- Ask to watch the video on data handling on “www.orangewebsupport.co.in”. **[Tech Connect]**

